THE GEORGE WASHINGTON UNIVERSITY
SCHOOL OF MEDICINE AND HEALTH SCIENCES

Medicine + Health

SPRING 2017

ADVOCACY IN ACTION

A NOTE FROM ROSS HALL

Welcome to our Spring 2017 edition.

I am incredibly proud of our students and trainees. They are a diverse, altruistic, exceptionally bright group who came to the George Washington University (GW) School of Medicine and Health Sciences (SMHS) to grow professionally and personally. Now, as we prepare to transition from one academic year to the next, I want to congratulate our outstanding graduates. I am proud of everything they have accomplished.

I've always felt enormous pride in being an alumnus and faculty member of SMHS. No, we don't have a football team, and our sports teams don't always draw national attention. However, I *know* that I received a great medical education and residency training at GW. And as dean, I *know* that we have an amazing group of talented and dedicated faculty and staff. I am unbelievably proud of them and the work that they do to make a difference in our students' and patients' lives; in the community; and, by advancing knowledge, in medicine at large.

The school's reputation for creating tomorrow's health professionals, advancing research, providing high-quality care, and effecting change in our local, national, and global communities has never been higher. When you read these stories touching on each aspect of our mission, I hope you share the same sense of pride as our students.

As the university moves closer to completing its Making History fundraising campaign, and as President Steven Knapp concludes his tenure here, I hope that your pride in SMHS leads you to make a gift to support our mission of being a world-class academic medical center. Our students and faculty who benefit from your philanthropy will be eternally grateful.

JEFFREY S. AKMAN, M.D. '81, RESD '85
VICE PRESIDENT FOR HEALTH AFFAIRS
WALTER A. BLOEDORN PROFESSOR OF ADMINISTRATIVE MEDICINE AND DEAN, SCHOOL OF MEDICINE AND HEALTH SCIENCES

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Features

COVER STORY

Advocacy in Action **14**

BY CAROLINE TRENT-GURBUZ

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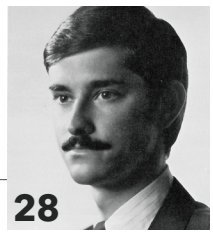

Departments

ON THE WEB

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MAKING THE ROUNDS

Lt. Gen. West Addresses Graduates

Lt. Gen. Nadja West, M.D. '88, will serve as keynote speaker at the George Washington University School of Medicine and Health Sciences M.D. program diploma ceremony on May 21.

West is the 44th surgeon general of the United States Army and commanding general, U.S. Army Medical Command.

She has served in a variety of leadership positions and has commanded at the Army Community Hospital, Army Medical Center, and Regional Medical Command levels. Before being named surgeon general, she served as the U.S. Joint Staff surgeon.

West will receive an honorary degree of doctor of public service at GW's 2017 Commencement on the National Mall. ■

MFA Welcomes New CEO

George Washington University (GW) Medical Faculty Associates (MFA) recently selected Robert E. Kelly, M.D., to serve as CEO of the clinical enterprise. In this role, he will provide leadership and strategic physician enterprise integration, as well as overall operational management for the organization. Kelly brings to GW decades of both clinical and administrative experience, most recently serving as president and chief operating officer of New York-Presbyterian Hospital, and as a faculty member of Weill Cornell College of Medicine since 1985.

As CEO, Kelly will partner with Anton Sidawy, M.D., M.P.H. '99, president and chair of the Board of Trustees at the GW MFA, and Lewis B. Saltz Professor and Chair of Surgery at the GW School of Medicine and Health Sciences, and other key members of the GW MFA community to further develop and implement the organization's mission and strategic vision. ■

Match Day

Follies

Day in the Life

Match Day

1 Marcus Mitchell welcomes an embrace after learning he has matched in his top choice for anesthesiology: the University of Maryland Mercy Medical Center and Johns Hopkins Hospital.

2 Olivia Beaubrun, left, and Theiju Sebastian, right, smile for the camera after opening their envelopes to see where they've matched: St. Louis Children's Hospital and Yale University New Haven Hospital, respectively. "This is way more emotional than I could've imagined," said Sebastian, who matched in pediatrics, as did Beaubrun. "It's the best day ever."

3 Cristina Zottola, right, who matched in obstetrics and gynecology at Lenox Hill Hospital with Hofstra Northwell School of Medicine, laughs at the reaction from family and friends after showing them her letter.

Follies

4 Fourth-year medical students bid Auf Wiedersehen – with lyrics tweaked to better suit a medically inclined audience – during Follies, the annual student-run program of skits, dances, and songs.

5 The M.D. Class of 2017 celebrates the end of their final Follies with an eye toward the future: the institutions where they will complete their residencies.

6 Third-year M.D. students Christina Canini, left, and Omid Manoochehri, right, have a spirited debate over Suzanne Arnott, who awaits a decision.

Day in the Life

7 First-year medical student – but almost a doctor! – Vinay Rao stands with his family at the kickoff to "Day in the Life," a biennial event when M.D. students' family and friends participate in a white coat ceremony, interactive sessions and discussion groups, and a diploma ceremony.

8 Juliet Lee, M.D., assistant professor of surgery at SMHS, helps an SMHS family member perform proper CPR technique during "Code Blue," one of several sessions offered to Day in the Life participants.

9 Day in the Life participants get a true taste of what medical students regularly face: an exam.

Research Days Showcase Breadth and Depth of Student Endeavors

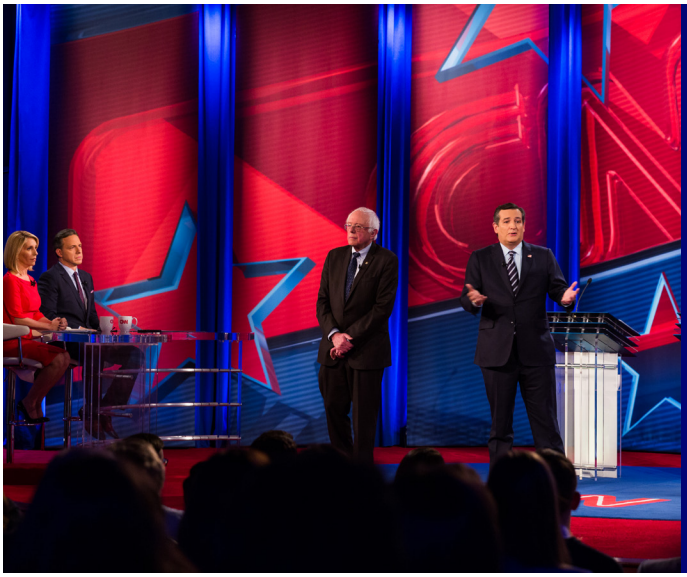
On the second day of the 22nd annual George Washington University (GW) Research Days, School of Medicine and Health Sciences (SMHS) students had a chance to show off their work outside the classroom to their peers and the GW community.

"That's the fun part [of Research Days]," second-year M.D. student Sharjeel Chaudhry said of seeing his classmates' research projects. "It's a great way to make a new connection, just from understanding someone's research and talking with them about it."

Chaudhry presented his work as a winner of the William H. Beaumont Research Award, as did first-year M.D. students Brendan Campbell and Lauren Jacobs. The new tradition began last year when the editors of *Fusion,* the William H. Beaumont Medical Research Honor Society's student-led publication, decided to give students the opportunity to present their research.

In addition, more than 200 SMHS students presented posters at the event.

To download a copy of the most recent edition of Fusion, visit *smhs.gwu.edu/research/publications/fusion.*



Putting Health Care on Center Stage:

Standing on the stage in George Washington University's (GW's) Jack Morton Auditorium in February, Sens. Bernie Sanders (D-Vt.) and Ted Cruz (R-Texas) debated the state of the U.S. health care system.

Although the lawmakers did not agree on much throughout the debate, they were able to have a frank and open discussion about the Affordable Care Act's future.

"It was nice and refreshing for neither side to be yelling, but simply stating the facts and their positions," said John Marin, a first-year M.D. student at GW. "I definitely appreciate GW holding all these talks."

During the almost two-hour debate, Cruz and Sanders spoke about the role of the government in health care and the future of Medicare.

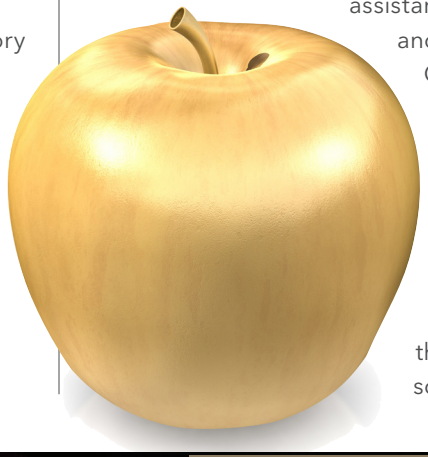
Service and Leadership

Sara Melita was recently selected to serve as the senior advisor and chief of staff to Jeffrey S. Akman, M.D. '81, RESD '85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of the GW School of Medicine and Health Sciences (SMHS). In her new role, she'll work with the SMHS senior leadership team to advance Akman's vision and priorities for the school.

Melita brings 20 years of senior leadership and advisory experience to the post, a decade of which has come at GW. In that time, she served as the assistant vice president for organizational development and effectiveness, where she focused on building effective teams and improving performance throughout GW. More recently, she was a senior advisor to GW's senior leadership team, working across schools and divisions to develop annual and strategic goals aligned with mission priorities. She also was involved in the development and implementation of GW's Vision 2021 Strategic Plan.

Taking Home the Golden Apple

Every year, medical and physical therapy students vote on the educators who have had a significant impact on their education; the 2017 Golden Apple Award recipients were Zhiyong Han, Ph.D., associate professor of biochemistry and molecular medicine; Marie Almira-Suarez, M.D., assistant professor of pathology; Kristin Gorelik, M.D., assistant professor of obstetrics and gynecology; Kathleen Calabrese, M.D. '08, assistant professor of emergency medicine; Holly Jonely, D.P.T., assistant professor of physical therapy and health care sciences; and Margaret Plack, D.P.T., Ed.D., professor of physical therapy and health care sciences.



UNDER A NEW UMBRELLA

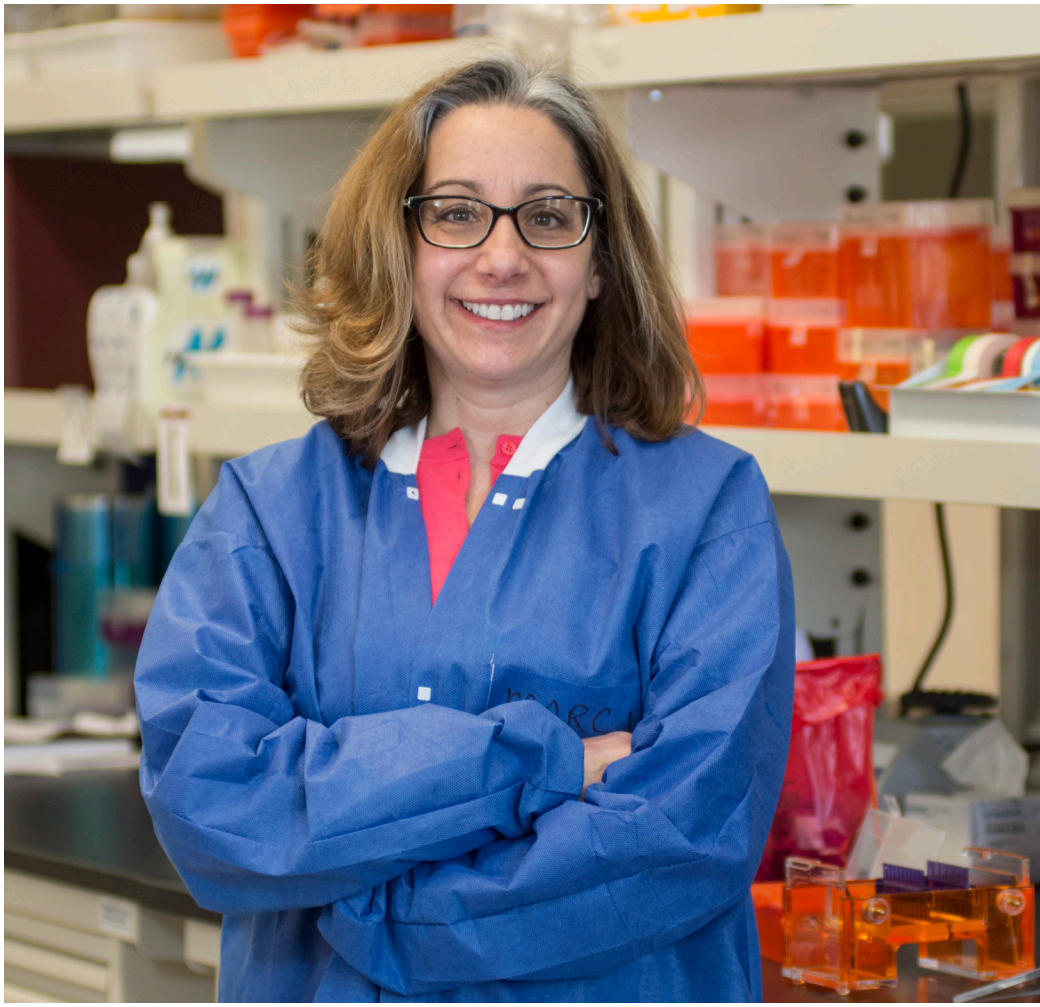
BY CAROLINE TRENT-GURBUZ

Brent Etiz, a Stanford graduate and former Silicon Valley techie, was in need of a change. "I had this period of enlightenment," he says, "where I thought 'I really want to go back and try [becoming a doctor],' so I started scouring the country for programs that offered all of the premedical requirements." The George Washington University (GW) School of Medicine and Health Sciences (SMHS) Post-Baccalaureate Pre-Medicine program fit the bill.

The program, designed to prepare college graduates with the prerequisites for admission, has long attracted highfliers like Etiz, successfully guiding them into medical school. Likewise, another SMHS program, Medical Laboratory

Sciences (MLS) — a combination of blended (a mixture of online and bricks-and-mortar courses) and graduate programs — has drawn ambitious students interested in ascending to the next step in their career.

"I love the program," says Brandy Holzman, an MLS student. After riding in a hunter/jumper horse show circuit until she was 28, Holzman felt she "needed to find a career that doesn't involve horses." Tired of traveling and suffering from back pain, she began working in an animal hospital, with an eye toward shifting to the human side of health care. "I felt too old [for medical school], so this [program] was a nice balance; I can be well-rounded and help with the diagnostic work and still talk to doctors. It seemed like a good fit for me."



With the success of the MLS and Post-Baccalaureate Pre-Medicine programs — both of which fell under the Clinical Research and Leadership umbrella within Health Sciences — came expansion. When GW started to build out the Virginia Science and Technology Campus (VSTC) in Ashburn, Virginia, an opportunity presented itself: The two programs were shuffled under the newly established Department of Integrated Health Sciences, led by interim chair Marcia Firmani, Ph.D., M.S.P.H., and relocated to the VSTC.

"We're able to have dedicated staff at the VSTC to advise on these programs and have people doing outreach specifically for these programs," says Firmani, who also serves as director of the MLS blended bachelor of science in health sciences (B.S.H.S.) and graduate programs and as assistant professor of integrated health sciences at SMHS. "For everyone in the department, their home is at VSTC. The benefit is, we now have that common ground that provides better opportunities to work together to expand the existing programs while building new programs."

The new department also includes distance-learning opportunities — a fully online B.S.H.S. with a major in MLS for medical lab technicians, five certificate programs, five graduate programs, and numerous military-affiliated programs — and future educational possibilities.

"We're in the process of developing dual-degree programs, and we are in the planning stages of a potential doctoral degree program to expand upon our current career pathway options at VSTC," Firmani says. "There are a lot of opportunities for growth, teamwork, and spearheading new endeavors, which is an exciting movement to be involved in."

Holzman says that having access to the VSTC campus for her program, which blends online coursework with on-site lab training, has been ideal. "I was scared at first, because I've never done online courses, but it's worked out well," she says. "Having a lab in Ashburn is great because I still have that contact between professor and student."

Kenia Gomez, who's in her last semester in the blended MLS program, has also found that the class structure suits her needs. "What I like about the program is that the laboratory class covers the same material being taught online," she explains. "[It] helps me understand the course material and the science behind it more."

Etiz, when he's not preparing for the MCAT with his cohort, has also taken advantage of what the VSTC offers. "Because there's the MLS program, there's also a research laboratory out of the Virginia campus, so I had the opportunity to assist in research with Dr. Marcia Firmani," he says. "To be able to have those opportunities while also completing my didactic work ... ultimately made coming to GW a very easy and intuitive decision." ■

CLINICAL TOOL KIT

CLASS Center Training Sharpens Diagnostic Skills

BY CAROLINE TRENT-GURBUZ

In August 2016, members of the George Washington University (GW) Hospital anesthesia team — including Samantha Brackett, who was just one month into her first year of residency — were waiting on standby in the interventional radiology (IR) suite. Their patient had presented to the Emergency Department with severe abdominal pain, but was stable enough to move to the IR suite for a procedure to embolize a ruptured vessel, the source of the problem.

Suddenly, recalls Brackett, "the patient experienced an acute intra-abdominal hemorrhage from the rupture of this vessel, and became very unstable. We were immediately able to secure the airway as well as manage the massive blood loss and critical situation that was unfolding. Immediately after intubating, I began to notice certain changes that are characteristic of MH."

Brackett explains in lay terms that MH, or malignant hyperthermia, is a rare genetic disorder that causes a defect in a type of skeletal muscle receptor. When certain anesthetic agents, such as inhaled anesthetics and succinylcholine, a neuromuscular blocking drug, interact with the receptor, a biochemical chain reaction occurs.

"[The body] generates excessive heat that actually breaks down the muscle cells," Brackett explains. "You can have pretty catastrophic damage. It's key that you treat it early, and even minutes in treatment delay will increase morbidity and mortality."

With the clock ticking, Brackett noted key signs of the disorder — increased exhaled carbon dioxide, increased heart rate and temperature, and muscle rigidity — and ran through the checklist of possible diagnoses in her head. The habit was one she had performed during an MH simulation just a few days earlier in the Clinical Learning And Simulation Skills (CLASS) Center at the GW School of Medicine and Health Sciences (SMHS) — a striking coincidence given that most anesthesiologists never see MH in their entire career, let alone within the first weeks of their residency.

"In all of the years I've been practicing, getting close to 20 years, I've never had a patient with MH, ever — that's how rare it is," says Marian Sherman, M.D. '99, assistant professor of anesthesiology and critical care medicine at SMHS. "But you talk about it every year in training, you talk about it on every standardized exam you ever take as an anesthesiologist. It's

definitely one of those clinical scenarios that's high stakes, and you'd better know what to do with it because it's our specialty."

It's for those reasons that anesthesiologists regularly train for cases like MH. For residents, however, simulating such a critical disorder not only incorporates minor simulation exercises, such as inserting an IV or arterial line, but also team training and communication skills.

"When you're doing high-stakes drills, like an MH drill, you don't want one person doing everything," Sherman says. "You want one person to lead the drill, you want to recognize people's skills and abilities and assign tasks to each person, and create conversation between the participants so that you can intervene most comprehensively in these crises. As always, the earliest determination of what's wrong relates to better patient outcome."

It's that type of training in which the SMHS CLASS Center excels. "You learn better when you do it yourself," says Claudia Ranniger, M.D., Ph.D., director of the simulation center and assistant professor of emergency medicine at SMHS, "and we don't let you leave having failed."

What's key, both Ranniger and Sherman say, is that the CLASS Center is a safe learning environment. Depending on the scenario, both residents and medical students, as well as nurses from GW Hospital, can practice their skills — whether with manikin Victoria in the labor and delivery suite; with another manikin, Hal, in one of two operating rooms; or in the high-fidelity rooms and the procedural skills lab — without worrying about negatively affecting patient outcomes.

"It's great to have a responsibility that you usually don't get to

From left to right, Marian Sherman, M.D.; Asheesh Kumar, M.D.; Marianne David, M.D.; Samantha Brackett, M.D.; Raymond Pla, M.D.; and Hank Allen, M.D.

practice and to test yourself in a safe environment," Ranniger says.

Rooms are set up as realistically as possible, with the kind of equipment students and residents would see in GW Hospital. Depending on the scenario, learners may know various details and operate accordingly; in other cases, students will go in without any information.

"The subject matter almost gives away what's important in the exercise, which is identifying variables and coming up with a broad differential diagnosis, and then making smart, informed interventions," Sherman says. "We might give them a little bit of information, like 'the patient you're taking care of is a 40-year-old person who has a history of asthma and had a knee scope under epidural anesthesia in the past. You're taking care of this patient now. The patient's in the OR, ready for induction of anesthesia.' "

In Brackett's simulation, there was scant contextual information. "We knew that the scenario would involve a type of anesthetic crisis; we just didn't know what type of emergency we were going to deal with," she recalls. "Our scenario involved a young, healthy patient having a fairly low-risk surgical procedure. The case began at the time of induction of general anesthesia in the operating room."

It was then that she ran through possibilities in her head, an ability that was strengthened with practice. "What, in particular, the anesthesiologists do when they 'sim' with their residents, is to say 'come up with a differential diagnosis in your head for all the things it could be, no matter how improbable,' " Ranniger explains. "Unless you do that, you won't think of it when it really happens. It keeps you engaged in care of the patient and thinking ahead, and that's really what's so important to prevent adverse outcomes: to see it coming, not wait until it happens and recognize it."

With her simulation team, Brackett considered potential diagnoses before settling on the correct one and shifting to the debriefing session, arguably the most important part of the simulation exercise. Because the CLASS Center simulation rooms are equipped with audio and video recording, debriefing participants can review their performance, learn the consequences of misdiagnosis, and reflect on their diagnostic process.

"There's no better way to learn than to have followed your line of thinking and get the wrong clinical consequence, because every single simulation session we do is followed immediately by a debriefing session," Sherman says. "Some people have an image of what they look like or what they're doing in a scenario, but if they're anxious and they're hanging back, you can see that when you do the video recap. A simple, gentle suggestion like 'move in next time' [works] because when you're in closer to the patient, the whole team knows you're there, your hands are ready to work."

That kind of encouragement directly feeds into students' and residents' performance when in a real-world situation. In Brackett's case, as the team tackled their patient's care in the IR suite, she mentally ran through the differential diagnoses, "picking it up, I think immediately, because I had in the back of my head that I had just experienced it and I knew it was such a potentially devastating diagnosis."

Brackett relayed her suspected diagnosis to the other anesthesiologists, an act of considerable courage. "For a first-year resident to say 'I think this patient's resuscitation might be complicated by a case of MH' [was brave] — she said it a couple of times, and I really applaud her for having the confidence to say again that something isn't right here," Sherman notes.

Brackett, however, credits the diagnosis to her team. "I had such a strong team around me," she says. "That definitely put me at ease, and we were able to effectively communicate and successfully treat the patient." ■

Reamer Bushardt: Cultivating Strengths Within Health Sciences

BY KATHERINE DVORAK

Reamer L. Bushardt, Pharm.D., P.A.-C., DFAAPA, brings a wealth of expertise to his role as senior associate dean for health sciences at the George Washington University (GW) School of Medicine and Health Sciences (SMHS). Bushardt is both a pharmacist and a physician assistant (P.A.) with experience in caring for underserved communities in rural areas of the Carolinas.

Bushardt earned a degree in pharmaceutical sciences and a doctor of pharmacy from the University of South Carolina. After practicing as a pharmacist in a cancer center, he trained as a physician assistant at the Medical University of South Carolina and practiced in rural primary care. Bushardt began his career in academic medicine in the Palmetto State, but he is no stranger to Washington, D.C. He serves as editor-in-chief for the Journal of the American Academy of Physician Assistants (JAAPA), based in Alexandria, Virginia. Bushardt says he regularly spent time between meetings learning about and exploring the District.

"Through my editorial work and as a visiting scholar, I met some of the faculty at GW, and I was really attracted to the breadth and depth of their talents," he says. "I've also had a very strong interest in learning more about health policy and about the innovative ways we can train health professionals and health care researchers — [areas where] the GW community is very much at the forefront."

Although Bushardt is still setting up his office in Foggy Bottom and adjusting to life in D.C., his vision for the future of the dozens of health sciences academic programs at SMHS is already forming. Here, he discusses his career path from pharmaceutical science to higher education and his aspirations for health sciences at GW.

Q: What is your vision for the future of health sciences at GW?

A: A vision for the future of health sciences is not something I needed to create. It already lives within the faculty, staff, and students across the health sciences programs. My job is to help them realize their strengths and come together as a diverse family of health sciences researchers and educators. Health sciences hosts 45 different academic programs, and many are unique with regard to curricula and program goals. Our health sciences students experience GW very differently — some as residential learners in Foggy Bottom or at the Virginia Science and Technology Campus (VSTC), others from all over the world in online learning communities, some within postgraduate programs in various hospital and health systems, or even during active military service via educational partnerships with the U.S. military. There is no one educational paradigm for health sciences.

My challenge is to build a shared identity that leverages our collective strengths. This challenge calls us to prioritize and even more fully embrace interprofessionalism as a value across every facet of what we do. It is about advancing translational research and pioneering new and innovative ways to prepare health care professionals. It is taking our combined knowledge from practice, from policy, from research, from public health, and from the classroom, and creating an inventive approach to reach our goals — an approach that is distinctively health sciences.

I really enjoy breaking silos and bringing together talent in ways it might not naturally combine, so I am beyond excited to be here at GW.

Q: What drew you to pharmacy?

A: Mentoring and apprenticing drew me to pharmacy. My father is a community pharmacist and leader in that profession, particularly in South Carolina. He worked for 40 years as a small-business owner. At age 10 or 11, I started

helping him in his drugstores. I loved the atmosphere. My father is such a warm and incredibly kind person. He forged incredible relationships with his patients, and humbly worked behind the scenes to help them solve problems that got in the way of healthier, productive lives. I aspired to be like him (I still do, actually). My professional identity as a pharmacist started forming well before I attended my first pharmacology or therapeutics class.

Q: After earning your Pharm.D., you went on to train as a P.A. What interested you in the P.A. profession?

A: My first job as a pharmacist was in a cancer center in South Carolina, primarily working with socioeconomically disadvantaged patients with cancer. There was a small group of oncologists, and I was a clinical pharmacist embedded with that team. I would support patients who developed adverse effects to treatment or who were balancing chronic medical issues along with their treatment for cancer. This partnership with physicians and with patients felt very natural. My physician colleagues were very focused on trying to cure the patients from their cancer, and they welcomed my help to address adverse effects or chronic medical illnesses. After doing that for a little while, I wanted to advance my diagnostic skills, and the P.A. profession really spoke to me. It offered me what I felt I needed.

Q: Recently a new health sciences department was created at the VSTC – the Department of Integrated Health Sciences. Do you see more growth at VSTC in the future?

A: The VSTC is an incredible asset for the university and region. This campus is a focus for much of our targeted growth in health sciences. The synergy realized between schools with VSTC-based programs is excellent. The School of Medicine and Health Sciences has strong collaborations with the College of Professional Studies and the College of Nursing, which both maintain strong contingencies there as well.

As a newcomer to GW, I am thrilled to have the opportunity to work in Northern Virginia, which is surrounded by leading companies and forward-thinking industries in technology and data management. The health sciences team regularly meets with dynamic industry executives there to learn about how their fields are evolving; to talk with them about partnerships in workforce development and innovation; and to explore new professions and lines of study that can continue to stimulate advances in education, research, and service. We are not trying to reinvent any wheels. If you want to transform discoveries into products and services that benefit society, then cultivating meaningful partnerships between higher education and industry is the right move.

Q: What got you interested in being editor-in-chief of JAAPA?

A: I've always enjoyed writing. One of my grandmothers was an English teacher, and during elementary and middle school, I would go after school to spend time with my grandparents. My grandmother would help me with my homework, with special attention for any writing assignments. She loved a red pen like any good English teacher, and I can still see her fine, red cursive tightly positioned between my original lines. Inadvertently, she offered me this boot camp experience in writing.

When I took my first job in academia at the Medical University of South Carolina as a ... faculty member, I was thrust into this space where writing grants and scholarly articles was an expectation, and I enjoyed it. ... I started peer reviewing and writing for JAAPA, and the editor asked if I would consider being a regular writer and part of the editorial board, so I did that. When the editor-in-chief retired several years later, I was approached about taking that position.

Q: What made you decide to pursue a career in academic medicine, and what does it mean to you to play a role in the education of future medical professionals?

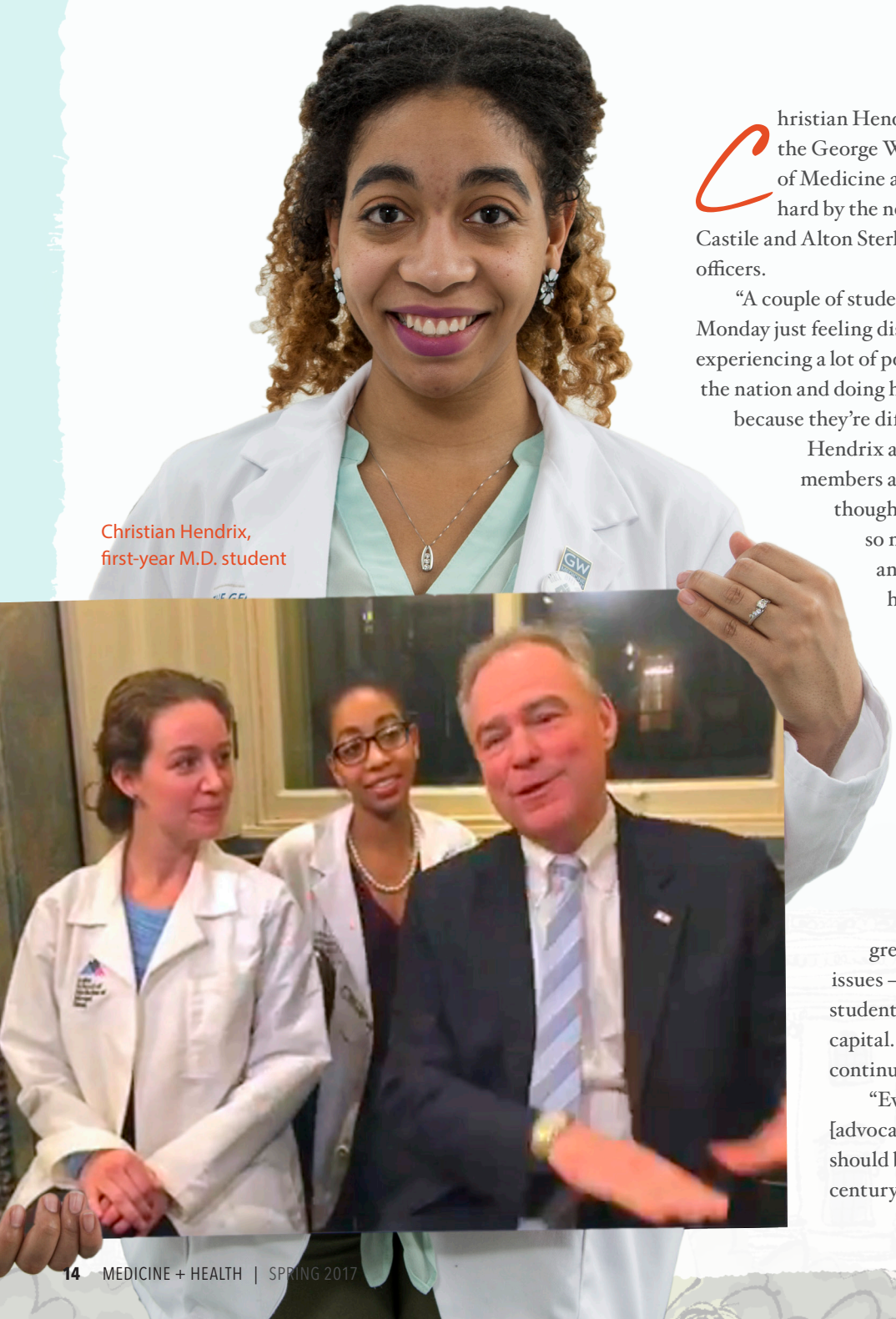
A: Growing up in a rural, underserved community shaped that desire. In my hometown, there were limited community resources and a small number of health care providers, so access to care was a problem. I did not have the context to understand it when I was younger, but the tremendous amount of health inequity there is very apparent to me now. Following in my father's career path as a pharmacist and subsequently practicing as a P.A.-pharmacist in rural communities, I had a personal desire to expand access to care. Rural primary care is hard work, but it can be very fulfilling.

As faculty and an administrator in academic medicine, I still strive to expand access to care and help patients and families avoid the struggle to find a caring, capable provider. This passion fuels my work in education and research. Over the past several years, I have worked harder to help innovate how care is delivered, so we can provide it more affordably, more safely, and with better coordination. This pursuit also involves leadership to help shape health policy and modernize the regulatory environment so all health professionals can practice to the full extent of their training and experience, which I believe is a practical strategy to improve access, lower the overall cost of care, and combat the current geographic misdistribution of health care professionals in the United States.

The talented students, dedicated staff, and passionate faculty within SMHS give me enormous hope for the future. I feel fortunate to be a part of such a distinguished university, and am leveraging every opportunity to build collaborations and benefit from the broad base of expertise in education and research at GW. Washington, D.C., seems like a long way from my beginning in rural South Carolina, but at the same time, it already feels a lot like home. ■

ADVOCACY IN ACTION

BY CAROLINE TRENT-GURBUZ



Christian Hendrix, first-year M.D. student

Christian Hendrix had just started her first year at the George Washington University (GW) School of Medicine and Health Sciences when she was hit hard by the news: Within a matter of days, Philando Castile and Alton Sterling had been shot and killed by police officers.

"A couple of students and I came to class the following Monday just feeling disconnected," she recalls. "We had been experiencing a lot of political talk about bigotry and dividing the nation and doing harmful action against people just because they're different from you."

Hendrix and a few friends talked to GW faculty members and returned to class, sharing their thoughts after the lesson had wrapped. "We had so much support from the administration and from everyone in the class, through hugs and tears and solidarity."

That support — and the desire to speak up — spurred Hendrix to do what so many other SMHS students have done before her: act.

STUDENT ACTIVISTS

GW has a long history of activism and advocacy — during the last several decades, students have supported HIV/AIDS research, measures for patient outcomes, and efforts to provide greater equity in health care, among other issues — and that is precisely why many SMHS students choose to attend school in the nation's capital. SMHS leadership has also sought to continue to shape student activists.

"Every clinician needs to recognize that [advocacy] is part of what their scope of practice should be to be an excellent clinician in the 21st century," says Lawrence "Bopper" Deyton, M.D.

'85, M.S.P.H., senior associate dean for clinical public health, and professor of medicine at SMHS. "We take no position in what we teach here on what students' positions are or should be. We just want students to know how to develop their own viewpoints and be able to know how to advocate for their viewpoints when they are practicing clinicians."

Those perspectives may be dynamic, Deyton adds, but what's key is for students to embrace their passion. It's a stance Grace Henry, Ed.D. '12, director of the Office of Diversity and Inclusion and adjunct assistant professor of medicine at SMHS, echoes.

"We want a social activist, but we want these students to recognize that the definition is crafted by themselves," she says. "I truly want this generation to realize that they don't have to be constrained by what they've seen activism to be, but that they have the ability to define it and be as effective as they need to be to make the change they want to see."

As Henry explains, for some, activism means writing letters, signing petitions, and calling representatives; for others, it means organizing, marching, and putting a face on an issue. In 2014, for example, M.D. program students held a die-in for White Coats for Black Lives, a movement aiming to eliminate racial discrimination in health care, in front of the Foggy Bottom Metro station; in January 2017, the SMHS Inclusion Group posed for photos with white boards displaying messages of solidarity for #WhiteCoats4BlackLives.

"One thing I'm learning is that you can be involved in many different ways," Hendrix says. "Involved doesn't mean that you have to take on a visible, active role. Involved can be little things; just voicing awareness can be a small step anybody can take."

POLITICAL ACTION

Hendrix's own steps came in the form of organization. She joined the SMHS student-led Social Justice Interest Group, which focuses on inclusion, solidarity through helping those in need, and using its voice to advocate for patients.

The group also worked with classmates who added two chapters, one for White Coats for Black Lives and another for the American Medical Student Association, designed to promote medical student activism. "The main thing we want to do is reduce health

"As health practitioners, we see a lot that's on the ground … we can bring the perspective of 'coverage is good; coverage has helped; coverage has been good for patients.' Those are things we can see firsthand."

– Jamie Majdi, third-year M.D. student

John Marin, first-year M.D. student

disparities," Hendrix says. "We think one platform is through social justice."

With that platform in mind, Hendrix joined Protect Our Patients, an Affordable Care Act anti-repeal campaign, and helped organize a D.C.-based summit in early January 2017. On Monday, Jan. 9, SMHS M.D. program students Jamie Majdi, Camilla Maybee, Mariama Evans, and Rayna Sobieski joined their fellow classmates and students from across the country at the Department of Health and Human Services, and together they marched on Capitol Hill, where they delivered the #ProtectOurPatients petition to members of Congress and their legislative aides.

"Because of our position as health care providers, we have a moral imperative to advocate for patients," says Majdi, a third-year M.D. student who met with aides for Sens. Dick Durbin (D-Ill.) and Tim Kaine (D-Va.). "I truly think that if we were

"Change is only going to come when someone steps up, says that something is a problem, and makes their voice heard. I do think it's really cool that even as students, we have this ability to shape what the future of physical therapy is going to look like, and that's a really powerful tool. It's doing ourselves an injustice and our future patients an injustice if we don't advocate and speak up to make our care the highest quality it can be."

– Sarah Guenzburger, second-year D.P.T. student

Sarah Guenzburger, second-year D.P.T. student

to look at health care policy in a reasonable and measured way, everyone would agree that more coverage is best for the people of the United States."

SMHS Doctor of Physical Therapy (D.P.T.) students have taken a similar approach to advocacy, participating in the American Physical Therapy Association (APTA) Federal Advocacy Forum in March 2017. The forum, says Annie Golovcsenko, a second-year D.P.T. student, had an educational bent, where participants, professionals, and students alike heard different speakers "talk about the issues that our patients are having to deal with and how we can be advocates for them, not only in the health care field, but also on Capitol Hill to our legislators."

"It was a great time to talk to other P.T.s and P.T. students about ways to get involved and to advocate for our patients, and also figure out the most effective way to go about talking to our representatives," Golovcsenko explains. "The APTA has a clear process to support us doing this; they were there giving us advice and tips to go about it."

That approach to advocacy — speaking to representatives and voicing patients' needs — is why third-year SMHS M.D. student Ashtin Jeney took action to ensure sure she has a "seat at the table."

"It's one thing to be vocal, it's one thing to have an opinion, and it's one thing to care about issues," Jeney says, "but putting yourself at the table, with the people who are having the conversation to enact change, I think, is really where we have to [be]."

"Just being in D.C. and having so many faculty members in the leadership roles of professional organizations like the AAPA [American Academy of Physician Assistants] … I think [it gives us] a great responsibility to be advocates for the profession."

– Ellie Frye, first-year P.A. student

Jeney is the sole student representative on the bipartisan American Medical Association Political Action Committee (AMPAC) board. While the board works to make sure physicians' voices are heard in policy and supports candidates who prioritize health-related issues, Jeney's role is more concentrated: she raises awareness of AMPAC's mission by reaching out to students. It's an opportunity that could only have opened up at GW, she says.

"The Healing Clinic definitely makes you think creatively. … [L]earning to navigate barriers to care that aren't taught in the classroom is a unique opportunity that only the Healing Clinic can provide."

– Kirsten Almagro, first-year P.A. student

At GW, "there are so many opportunities to get involved in policy, not just through our curriculum and the great things that we've gotten to do with the new [clinical public health theme] ... but also to get involved in different organizations here in D.C.," she explains.

FACE-TO-FACE WITH PATIENTS

One inspiring organization has been the Healing Clinic, an SMHS student-run free clinic founded in 2006 that is open to the community.

"The Healing Clinic is a great way for people who want to get involved to, in a very direct way, help people and take care of patients," says John Marin, a first-year M.D. student at SMHS and director of communications for the Healing Clinic.

The clinic, which has two locations, one in Prince Georges County, Maryland, and another at Bread for the City in the District, is made up entirely of student, resident, and clinician volunteers.

"Being able to simultaneously give back to the community while working on our patient interaction and physical exam skills is so valuable," says first-year physician assistant (P.A.) student Bailey Ernstes. "I can't tell you how many times I've heard a classmate who's been at Healing Clinic say 'I'm so glad I went to that; it reminds me of why I want to do this.' "

The P.A. students, like their M.D. and D.P.T. counterparts, draw particular inspiration from working with patients in the community, and their volunteer efforts have extended to other groups, such as the SMHS DC Health and Academic Prep Program, which exposes rising high school seniors to health care professions. They also regularly advocate for their profession — P.A. students in 2015 spoke to Congress about P.A. research funding, diversity, and student loan repayment programs — and they take a class specifically on the role physician assistants play in health care.

"It was an eye-opening course for everyone," says Ernstes. "I didn't realize there was so much advocating that still needed to be done." ■

THE LIGHT

BY CAROLINE TRENT-GURBUZ

In all her years conducting research, Narine Sarvazyan, Ph.D., professor of pharmacology and physiology at the George Washington University School of Medicine and Health Sciences (SMHS), has had several ideas, but one — a cardiac imaging catheter — is the closest she's come to traversing the information chasm between bench and bedside.

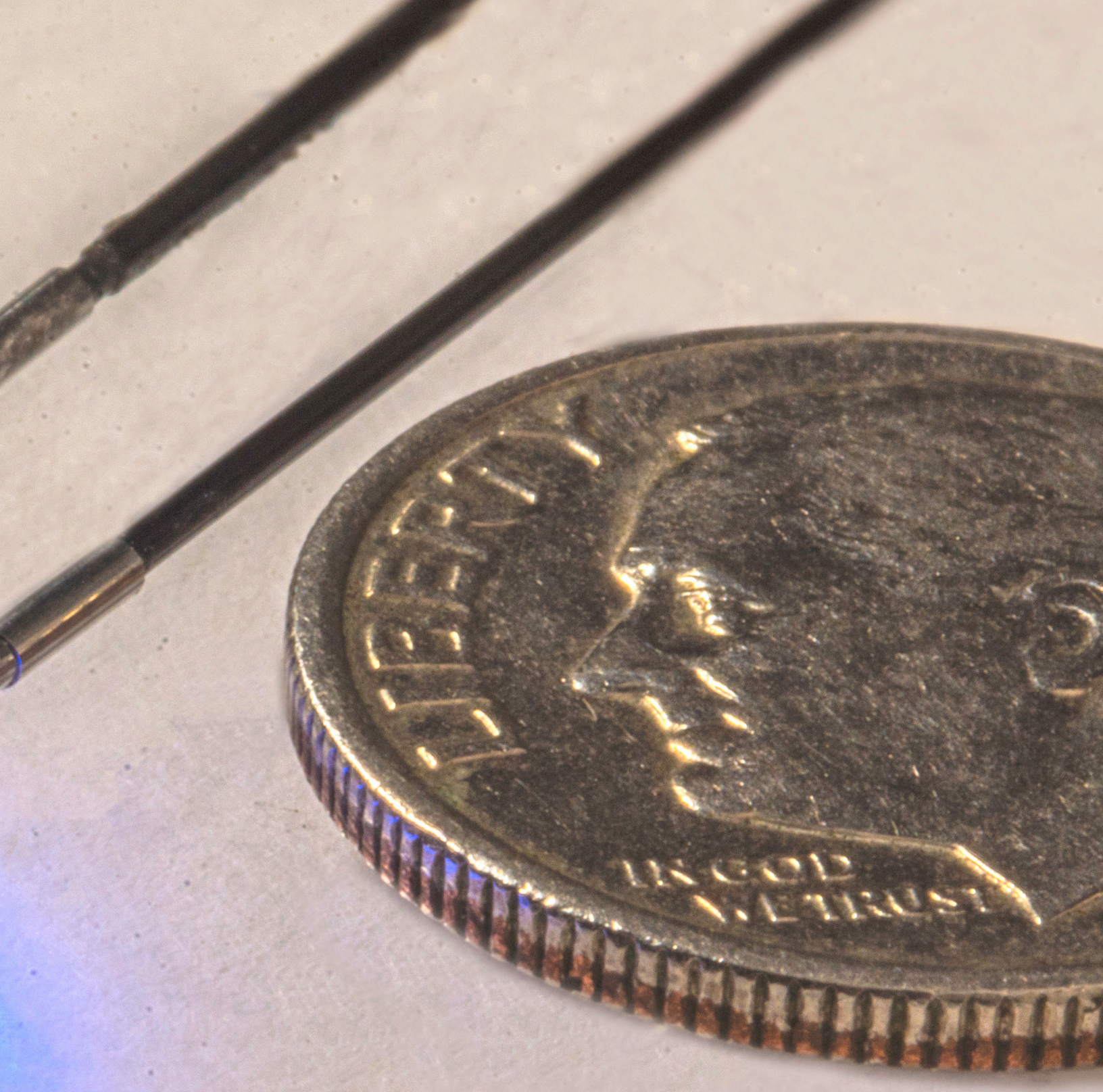
"There are still many, many hoops to jump through, but we're at least approaching [a clinical device]," she says. "It doesn't really happen very often in basic science research. Usually we think, 'Well, this might help sometime in the future because we are providing basic knowledge of how things work.' In this case, I am cautiously optimistic, let's put it that way."

Seeing the Invisible

Sarvazyan's journey began with Marco Mercader, M.D., director of electrophysiology research and associate professor of medicine at SMHS, and Matthew Kay, P.E., D.Sc., an associate professor of biomedical engineering at the GW School of Engineering and Applied Science (SEAS), when the three began experimenting with NADH (a reduced form of nicotinamide adenine dinucleotide) fluorescence imaging on the surface of ischemic animal hearts. "If you illuminate tissue with ultraviolet light, there's a fluorescence that comes out, and it can be picked up and detected in the laboratory," explains Mercader. "So Narine and I started experimenting with what would happen if you did ablation of the cardiac tissue to the fluorescence provided by NADH."

Cardiac ablation, a procedure that burns or freezes heart tissue in an effort to correct arrhythmia, such as atrial fibrillation, comes with its own special set of complexities. Right now, Sarvazyan says, surgeons perform ablation without being able to see what happens to the tissue, which accounts for the current success rate of the procedure: Typically, 60 percent of patients see their arrthymia corrected, and 40 percent return to the hospital for an additional procedure. Out of that number, 10 to 15 percent return one more time.

"There are different means to ablate abnormal sources of electrical activity, but today a surgeon does not really have the means to say, 'OK, I destroyed the tissue,' because this procedure is essentially done in a blind fashion," Sarvazyan



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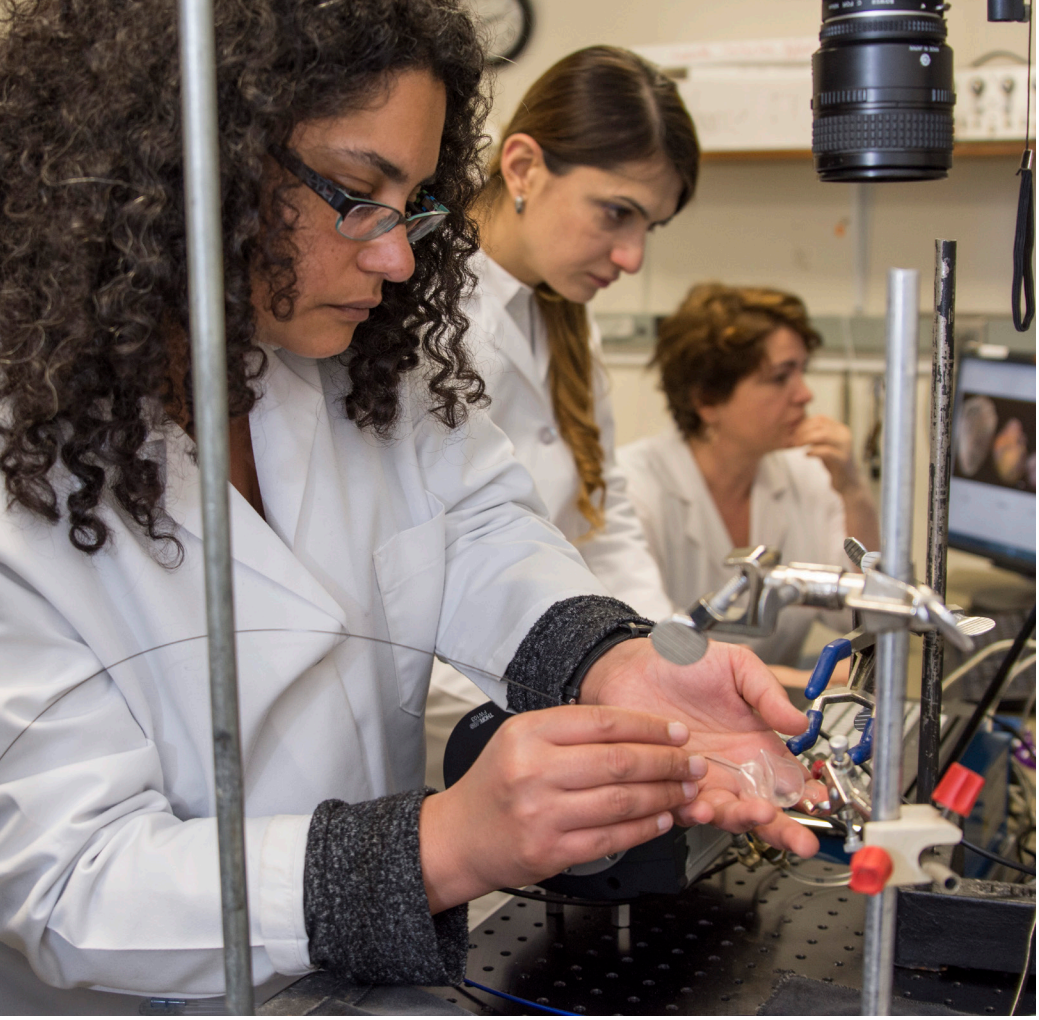


says. "There are no direct imaging tools to visualize the ablation process."

That's where Sarvayzan's team comes into play. The team's goal was to develop a new generation of cardiac imaging catheters that could detect changes in tissue autofluorescence caused by ablation. The current version of their catheter, designed to thread into a patient's vein and up to the heart, has 17,000 imaging fibers, each capable of picking up a fluorescent signal from the tissue and relaying it to a camera. She compares it to a butterfly eye, capable of using multiple receptors to receive light signals.

In order to see ablation lesions inside the heart, however, it's not enough to have a small and flexible imaging fiber bundle, Sarvazyan says. Surgeons have to be able to detect damaged tissue beneath thick layers of collagen covering the inner surface of atrial tissue. "The contrast is very, very small," she says. "So, to be able to reveal damaged tissue, we use technology called 'hyperspectral imaging.' "

Hyperspectral imaging, which has long been used in agriculture and astronomy, is rapidly gaining popularity for clinical applications. With the help of a computer, Sarvazyan explains, it can distinguish individual pixels based on the small spectral differences between them, creating a color map showing ablated tissue and viable gaps still needing ablation.

Sarvazyan and her team also discovered that the intensity of the assigned color was proportional to the depth of the affected tissue. "Our data suggest that when one plots the intensity of the lesion component revealed by hyperspectral imaging, it predicts how deep the lesion is," she says. "That's what is known as the holy grail of atrial fibrillation treatment."

In addition to the imaging fibers, the catheter includes an illumination fiber. "We need to minimize all parts of the catheter for it to fit inside a vein," Sarvazyan explains. "So from a technical perspective, our main challenge is to get enough light to the tissue to illuminate it, as well as to get enough light back so we can actually spread it into individual wavelengths to do hyperspectral image analysis." The team's solution for the current catheter was to envelop the illumination fiber with a pear-shaped saline balloon that acts as a kind of lens, moving blood away from the fibers while lighting the way forward.

Seeking Partnership

While progress ticked along at the bench, Sarvazyan and Mercader, wanting to move their catheter to the translation phase, needed to find financial support. The first phase of the project, Mercader says, was funded by GW and SMHS clinical partner GW Medical Faculty Associates. Then, he adds, came the question: "How are we going to get other people interested in this?"

They started by drawing attention to their work. In 2011, the team submitted their idea to the GW Open House and Innovation Competition. They then filed a patent, with Mercader leading the way to find an investor, which he did: venture capital firm Allied Minds. Together, Allied Minds and GW formed a joint company, LuxCath, LLC, which then sponsored a small business, Nocturnal Product Development, LLC. The latter company, essential to the catheter's development, is an engineering firm specializing in biomedical device design and manufacturing. More recently, the team welcomed Murray Loew, Ph.D., professor of biomedical engineering at SEAS, to help with additional image analysis and processing of algorithms.

Next, with Nocturnal Product Development as their small business partner, Sarvazyan's team applied for and received a $200,000 National Institutes of Health (NIH) Phase I Small

Business Technology Transfer (STTR) Program award in 2014. "Phase I allows one to have the initial funds to prove that the main concept works," Sarvazyan explains.

The pace of progress slowed when it came to the larger STTR Phase II award. The NIH, Sarvazyan says, is keen on translating whatever researchers find in the lab to the real world, and Phase II of the grant includes elements critical to that goal, such as a marketing plan. "That was certainly uncharted territory for me," she says, "but we got it done with help from a marketing firm and our business partners." In April 2015, she submitted the paperwork for the grant, and by July, the team had received a high score on the proposal, successfully checking off each of the criteria.

The NIH, she says, typically awards a Phase II STTR grant two or three times a year. Given her past experience in the grant process and the top marks for her project, Sarvazyan thought the award was a given. At first, "obviously, everyone was ecstatic," she recalls. "When you get a score like this, you think that you are definitely going to receive the money. But in the fall of 2015, the NIH changed its rules by adding yet another layer of selection for this specific type of grant, which gave us a lot of anxiety." Sarvazyan was now caught in limbo. "The hardest part was that once you get this score, everyone you call — your chair, your students — they all assume you get the money," she says. "But then for a year, we were still awaiting the NIH final decision, while trying to keep our team and spirits together. "

Finally, in August 2016, Sarvazyan received the news. "Luckily for us, the decision was in our favor."

The two-year grant, totaling $2.27 million, is split between GW and Nocturnal Product Development, with Sarvazyan as the primary investigator. Since the award, the project has moved one step closer to the bedside: On Jan. 31, 2017, the team conducted a large animal study using the first iteration of the hyperspectral imaging catheter. Mercader also traveled to Europe to test an earlier, simpler version of the catheter to get feedback on its functionality.

"We're so very proud that the catheter made it into an actual catheter; it comes in a box, has a name and a serial number, and it was actually [used] for the first time this year," Mercader says. The team went to Prague to do first-round testing with both U.S. and local electrophysiologists.

For now, the team is implementing the many tasks outlined in Phase II and preparing for Phase III, which requires a matching investment from a venture capital firm or angel investor to qualify for NIH support. In the meantime, however, Sarvazyan and her team can already lay claim to a major milestone. They are the first at SMHS to receive an STTR Phase II award.

"We believe and hope that this powerful new technology will finally help cardiac surgeons and electrophysiologists to see what was once invisible," she says. ■

OBSERVATION:
On Autism

Opening New Doors on Autism and Neurodevelopmental Disorders

BY STEVE GOLDSTEIN

As one of the world's pre-eminent autism researchers, Kevin Pelphrey, Ph.D., has built a reputation that can open the doors to virtually any medical research institution — and the institution would consider itself fortunate to have him. But Pelphrey chose The George Washington University (GW).

Why? Because his ambitions as director of the new Autism and Neurodevelopmental Disorders Institute (ANDI) extend beyond investigation, to influence.

"We're interested in influencing policy decisions," says Pelphrey, citing one of the three chief priorities of the institute, which embraces research and clinical care and will be housed primarily in a state-of-the-art clinical center at GW's Virginia Science and Technology Campus in Ashburn. In addition to his role as director, Pelphrey, a boyish-looking 43-year-old, is the inaugural Carbonell Family Professor in Autism and Neurodevelopmental Disorders, and professor of pharmacology and physiology at the GW School of Medicine and Health Sciences. Through ANDI, Pelphrey is creating a one-stop resource for families affected by autism in the Washington, D.C., area and beyond by connecting faculty members at six GW colleges with clinical partners GW Hospital, Children's National Health System, and the GW Medical Faculty Associates.

As part of the network, Pelphrey will be joined by Ashley Darcy-Mahoney, Ph.D., assistant professor of nursing at the GW School of Nursing and a neonatal nurse practitioner, who will serve as ANDI's director of infant research. "She was a terrific hire that I didn't have to do," says Pelphrey, who celebrated his first anniversary at GW on April 1.

A Firm Foundation

ANDI received $12 million in initial funding for research. Pelphrey cites the recruitment efforts of GW Vice President for Research Leo Chalupa, Ph.D., as very persuasive, and is also grateful for the commitment of GW Board of Trustees Chair Nelson Carbonell, B.S. '85, who gave $2.5 million to establish the endowed professorship Pelphrey holds. Carbonell's son, Dylan, was diagnosed with autism as a 2-year-old.

Autism is relatively common, affecting an estimated one in every 68 children in the United States, yet it is widely misunderstood. So broad are its manifestations that it is described as a "spectrum" disorder. Autism may be experienced as the gaze unmet, the outstretched hand unshaken, the conversation turned riddle. The disorder is a mental prison of sorts, in which the "inmate" has difficulty communicating and forming relationships with other people and in using language and abstract concepts.

Close Ties and Choice Connections

Pelphrey has two major priorities for the institute. The first, he explains, is building a comprehensive clinical and research infrastructure. If parents have concerns about their child's development and they start thinking about a place to go, Pelphrey wants them to think of GW and ANDI. "We need to

be able to comprehensively evaluate the patient, provide advice and discuss possible neurodevelopmental treatments, and have the research that will explain the kinds of therapies that will work, and ones that may not," he says.

The second priority is for the institute to serve as a national model for treatment in post-adolescence. Therapies for autism spectrum disorder cannot be narrowly focused on children from infancy to 3 years old. The adult transition, especially during the teenage years, is also an important period in brain development. "The brain is reorganizing," says Pelphrey, and it presents opportunities to intervene. He adds that there's "a wave of young adults with autism coming in the next 10 years."

Pelphrey has been studying brain development for 16 years, beginning as a postdoctoral researcher at Duke University. Practical considerations — "it was hard to build academic tenure," he notes — caused him to jump off that track for a while. Personal issues drove him back, intensively. "My daughter, Frances, was diagnosed with autism when she was a little over 3 years old," he explains. "We noticed general developmental delays and a slowness in developing language. But she was very social with people and that delayed the diagnosis for a bit."

Frances, now 13, provided passion and a new focus for Pelphrey. "This delay in diagnosing girls compared with boys got me very interested in studying girls with autism," he says. Why are girls such as Frances underdiagnosed? According to Pelphrey, boys are more susceptible to neurodevelopmental disorders than girls. Moreover, there's a kind of "masking" related to girls in that they tend to appear more social than boys. "Thus you have a significant number of girls with problems, but they are not rising to the diagnosis level to get the attention they need," he says. Pelphrey is the leader of an NIH-funded, $15-million multi-site project to study a large sample of girls with autism with a focus on genes, brain function, and behavior throughout childhood and adolescence.

Darcy-Mahoney's work addresses another under-researched subject: the connection between autism and prematurity, and particularly how this is represented among African Americans, who have a much higher rate of preterm babies. "African American children with autism are significantly under-represented and significantly underdiagnosed — and probably diagnosed in a less timely fashion," she says. Darcy-Mahoney, who arrived from Emory University in July, says the School of Nursing also has an Ashburn campus, "so we hope to cross-train in the area of neurodevelopmental pediatrics."

Broader Perspectives

When Pelphrey first entered the field in 2001, autism was viewed very narrowly and "virtually nothing had been done

on sex differences." He began exploring the theory that it was a disorder of early brain development that changes over time. Now, studies have concluded that autism "is a disorder of mid-fetal brain development that begins in utero," Pelphrey explains. Additionally, research has revealed reliable brain "signatures" of the disorder, which allows it to be traced over time. "This has gotten much more complicated than we ever dreamed of," he adds, "and we're talking about a whole collection of disorders."

ANDI will also provide cutting-edge advice on treatments, including behavioral interventions and pharmacological therapies. Pelphrey says the institute will explore why behavioral interventions are unsuccessful with some children and will employ drug interventions to increase responsiveness to behavioral therapies. Cognitive behavioral therapy will be studied as a method of treatment for older children and teenagers, who sometimes exhibit aggressiveness and social anxiety.

Pelphrey's familiarity with the Washington, D.C., region — his wife's family owns an oyster farm in Virginia Beach, Virginia — helped convince him that ANDI could have a wider impact. "We will be able to get attention through direct contact with policy-makers," says Pelphrey, who is on the federal Interagency Autism Coordinating Committee. "That prospect is very exciting." ■

"On Autism" is the first installment of a new online, long-form nonfiction series, OBSERVATIONS, covering several of the George Washington University School of Medicine and Health Sciences areas of academic excellence. Look for the next installment of "On Autism" at observations.smhs.gwu.edu.

Altruistic Spirit

SMHS donors provide "gift of life" to kidney patients in December 2016

BY CAROLINE TRENT-GURBUZ

At the George Washington University (GW) Transplant Institute in January 2017, Jose Reyes and Andrew Lewis stood in the waiting room. The two — each of whom had received a kidney from an anonymous donor in mid-December 2016 — watched as the door to the exam rooms opened.

"Meet your donor!" said J. Keith Melancon, M.D., chief of the Division of Transplant Surgery, director of the GW Transplant Institute at GW Hospital, medical director of the GW Ron and Joy Paul Kidney Center, and professor of surgery at the GW School of Medicine and Health Sciences (SMHS).

Lewis stepped back, visibly moved and struggling to form words when Jacob Lambdin, a third-year medical student at SMHS, approached.

"I'm speechless, but at the same time, I have so much I want to say," Lewis said. "I am so grateful."

Lambdin, who plans to pursue surgery, explained his decision to give his kidney to Lewis simply: "Whenever people ask why I decided to donate, I tell them 'It's a good thing to do, why not?' "

Reyes, meanwhile, didn't believe who his donor was; he'd been convinced it was a man. Instead, Sarah Miknis, photographer and production assistant with Biomedical Communications at SMHS, walked out.

"You?" Reyes asked, as he enveloped Miknis in a hug.

Like Lambdin, Miknis felt compelled to donate. She'd been on a bone marrow list for years, but never got the call for a match. In the meantime, as an SMHS photographer, Miknis had covered many kidney screenings and health events, and decided that giving her spare organ to someone in need was the right thing to do.

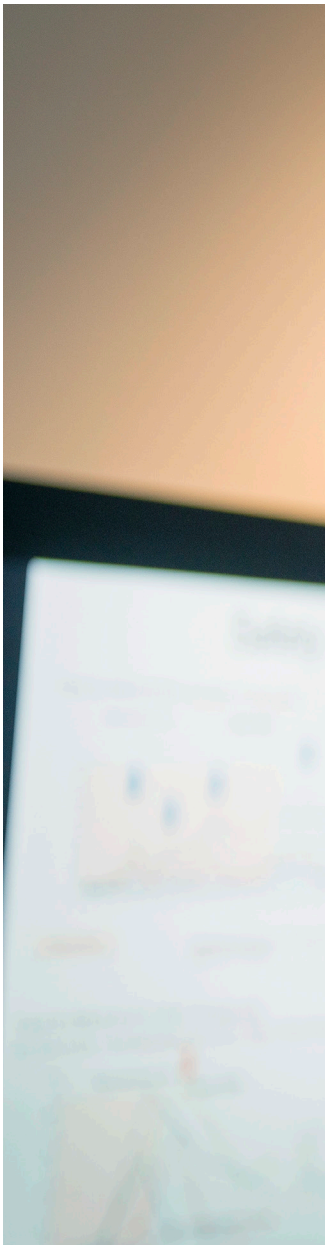
"If I'm healthy and I can [help] somebody, I want to do it," she said. "I have two kidneys, but I only need one."

Donating, she added, wasn't as hard a process as she'd anticipated — she had multiple screenings and was given ample time to consider her decision — and by winter, she was ready. Both she and Lambdin donated within a day of each other, effectively providing Lewis and Reyes with what Melancon termed "the gift of life."

"With everything that's going on in the world, the one thing I get asked all of the time is 'why?' " Melancon continued. "All I can say is, 'I don't know, but it gives me faith in humanity.' [When you donate,] you're not giving a kidney. You're saving a life." ■

The Winding Road TO PHARMA

BY KATHERINE DVORAK | PHOTOGRAPH BY JAMES PRISCHING



A straight line might be the shortest route between two points, but it's not always the most desirable course. For J. Carl Craft, M.D. '72, a more direct path might have led him far afield from his ultimate career, and the world of pharmaceutical research would have been far poorer as a result.

In high school, Craft was groomed for Stanford University's nuclear physics program; the father of a close childhood friend was a researcher building the university's linear accelerator, and together, Craft and his friend were regular visitors to campus, eagerly exploring the accelerator and the computer equipment. As high school graduation approached, however, Craft determined that nuclear physics was not his path.

His next twist came during medical school. Initially, Craft considered studying psychiatry, but soon decided you "had to be crazy to do psychiatry," though, he adds, "being a nuclear physicist was even crazier." By the time he left for George Washington University's (GW) Foggy Bottom campus, he had his sights set on pediatrics — but his path had one more kink in store.

The summer before his third year of medical school, Craft took a summer job with Hazleton Laboratories in Virginia, working on a project gathering data on Cromolyn sodium, an asthma medication. "I collected and evaluated the data, then wrote the package insert [the description and classification, regulatory specifications, and drug interaction materials] for the drug," he says. The total new drug application filing was six copies of 92 volumes.

That experience foreshadowed Craft's future in pharmaceuticals, but years would pass before he found himself working in the industry.

Craft graduated from GW a married man in 1972, and he and his wife, Susan, moved to Wisconsin for his pediatrics residency at Milwaukee Children's Hospital. It was the Vietnam Era when he completed residency, he recalls, and those who guaranteed two years of military service could select the branch they would join. Craft joined the Navy. "That allowed me to finish my training," he explains. "I entered as a pediatrician [serving in Guam as lieutenant commander and chief of pediatrics at the U.S. Naval Regional Medical Center], which was lucky since the war ended and 100,000 women and children were temporarily housed on Guam before being moved to the mainland."

Following military service, Craft started a pediatric infectious disease fellowship at the University of Texas Southwestern in Dallas under the guidance of George McCracken, M.D., and John Nelson, M.D., founders of The Pediatric Infectious Diseases Journal. He later joinedthe faculty at Tulane University in New Orleans, where he treated patients with infectious diseases, taught students, residents, and fellows, and was an investigator in clinical trials for pediatric antimicrobial drugs.

Despite his steady progression in medicine, Craft felt himself drawn to clinical drug research — specifically to Abbott Laboratories, where he developed the antibiotic clarithromycin, the first billion-dollar drug. When the pharmaceutical giant decided to move out of anti-infective drug development, however, Craft retired, but kept an eye open for the next turn of his career path.

That turn came up quickly in the form of Medicine for Malaria Venture (MMV), a new, nonprofit foundation funded by The Bill and Melinda Gates Foundation (BMGF) and others, designed to work on malaria drugs. At MMV, Craft, who served as chief scientific officer, developed the largest anti-malaria drug portfolio to date. MMV has continued to work to eliminate malaria with new medications, created with the stipulation that they cost no more than $1 per treatment.

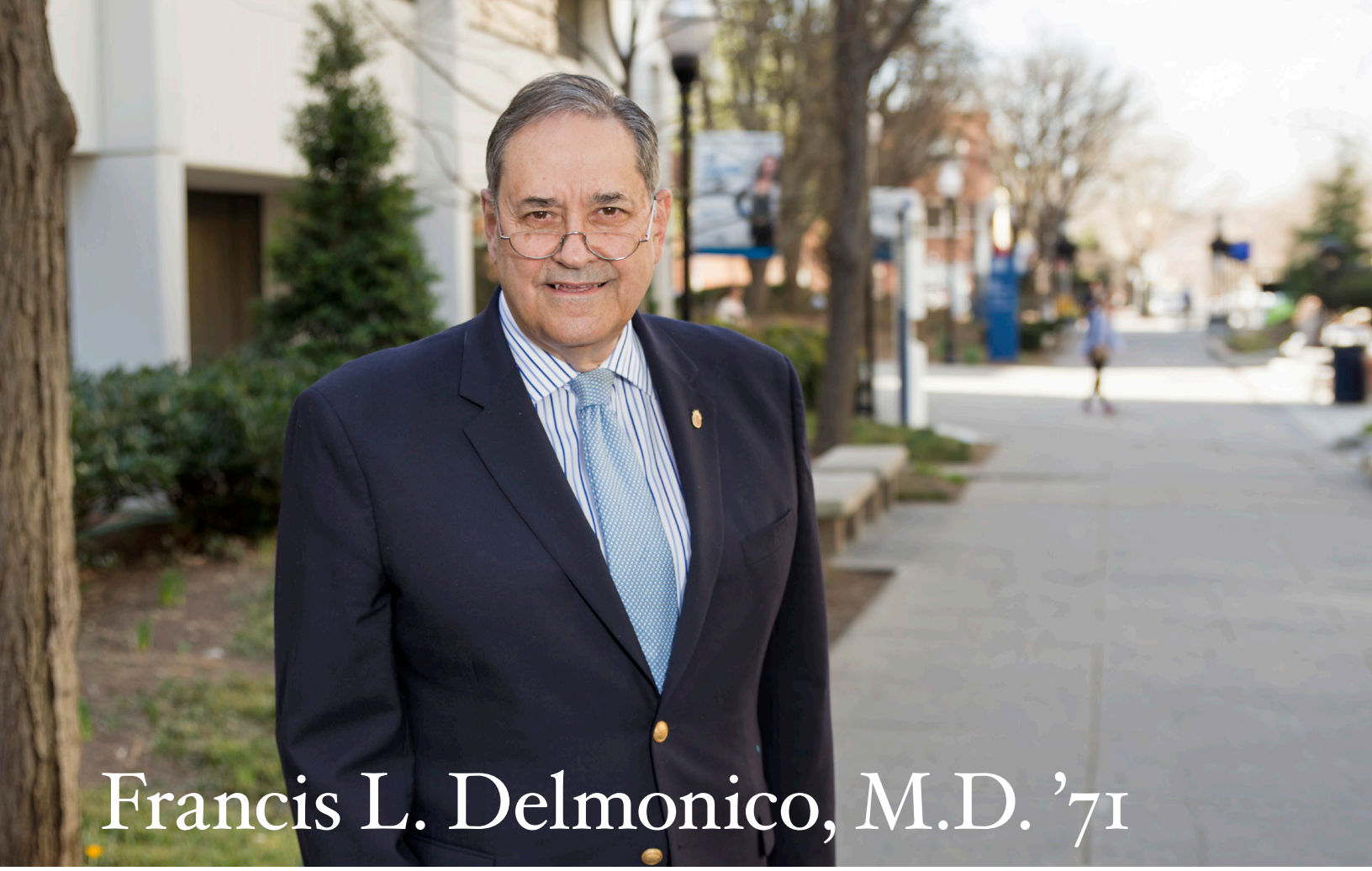
Both during and after his tenure at MMV, Craft served as a scientific adviser to Drugs for Neglected Disease Initiative in Geneva, a nonprofit drug research and development

organization that works on new treatments for neglected diseases, such as leishmaniasis, Chagas disease, and parasitic infections. He also served as a scientific adviser to an ANACOR Pharmaceutical and BMGF project to develop new drugs for tuberculosis and macrofilarial diseases. Rounding out his role as a scientific adviser, Craft, who maintained the role of chief medical officer as well, helped start a new drug company, CEMPRA Pharmaceutical, which is developing two anti-infective agents for serious infections.

More recently, Craft launched Aquarius Biotechnologies Inc. The company, he says, has developed new delivery technology for large-molecule drugs that cannot be absorbed from the gastrointestinal (GI) tract. When given intravenously amphotericin B can decrease nephrotoxicity. Only through nanotechnology, or cochleates, can molecules like amphotericin B be taken orally. The cochleates, he explains, are absorbed across the GI tract, actively taken up by macrophages within the blood stream, and delivered to the site of infection through the patient's lymphatics. As a result, high levels of the drug do not appear in the blood stream, which could decrease kidney damage.

This unique drug delivery technology, he adds, can formulate and stabilize a variety of molecules, including pharmaceutical drugs; insulin and vaccines; peptides; DNA plasmids, or gene therapy; and siRNAs.

Craft's career may have drawn him away from his high school plan of studying nuclear science, but the path he followed led to an illustrious career of discoveries in an innovative medical field. ■



Francis L. Delmonico, M.D. ’71

Championing an End to Organ Trafficking

BY THOMAS KOHOUT

On an evening last summer, Francis L. Delmonico, M.D. ’71, and his wife, Janice, attended a fundraising dinner at the tony Beacon Hill residence of Martin Walsh, the mayor of Boston. With Mayor Walsh and the Delmonicos that night was Monsignor Marcelo Sánchez Sorondo, chancellor of the Pontifical Academy of Sciences. Seated at their table was Jack Connors, CEO of the Board of Trustees for the Partners Complex of the Massachusetts General and Brigham and Women’s Hospitals. Looking out at the tables surrounding them, the Delmonicos saw a room packed to capacity with Boston’s social elite.

“We’re looking at each other, thinking ‘what are we doing at this table?’ ” chuckles the genial, self-effacing surgeon. Of course, the couple knew exactly *why* they were there — to raise money in support of the Pontifical Academy of Sciences and its mission to fight the global trade in human organs — but the real question was *how* did they get there.

Less than a year earlier, on Feb. 15, 2016, Pope Francis named Delmonico to the Pontifical Academy of Sciences, a centuries-old scientific community founded to “honor pure science wherever it may be found, ensure its freedom, and encourage research for the progress of science.” The lifetime appointment puts Delmonico among 80 of the world’s most eminent scientists and academicians, those acknowledged as much for their “moral personality” as their intellectual accomplishments.

“I was not accepted [to medical school at George Washington University] the first time I tried,” recalls Delmonico, marveling at the distance his medical career has covered. “The dean of admissions at that time, Paul Calabrisi, Ph.D., told me ‘you’re not going to get in this year. You have to go back and retake the medical admission test again. If you improve your score, and then you come back to me, you’ll do well here.’ ”

The reassurance, Delmonico says, changed his life. “It gave me the confidence to come back — the notion that if I

worked hard, I'd have a chance. I loved GW. It was a great place to go to school."

Since that early setback, Delmonico has built a breathtaking resume that features, among other accomplishments: professor of surgery and Emeritus Director of Renal Transplantation at Harvard Medical School and Massachusetts General Hospital; recipient of the National Kidney Foundation's David M. Hume Lifetime Achievement Award; adviser to the World Health Organization in matters of organ donation and transplantation since 2006; and current chief medical officer of New England Donor Services, which oversees all deceased organ and tissue donation for New England.

With his appointment to the Pontifical Academy — which features among its membership scores of Nobel laureates, such as Werner Arber, Ph.D., president of the Pontifical Academy; David Baltimore, Ph.D.; and Ada E. Yonath, Ph.D., as well as noted physicist Stephen Hawking, Ph.D. — Delmonico has ascended to some rarified heights for a middle-class kid from Brooklyn, N.Y.

Selection to the academy, unexpected as it may have been to Delmonico, makes perfect sense on closer inspection. By all accounts, the agenda laid out by Pope Francis is progressive; topics such as refugees, climate change, immigration, and the marginalized are regularly featured in his writings and addresses. Within discussion of the marginalized, explains Delmonico, you find human slavery, and that is where you find organ trafficking. The social media-savvy pontiff made his feelings on the subject unequivocal in an August 2016 tweet: "New forms of slavery such as human and organ trafficking, forced labor, and prostitution are true crimes against humanity."

Delmonico, who was in Vatican City leading a two-day summit on organ trafficking and transplant tourism in February 2017, is well-versed on the subject and its associated crimes of exploitation, coercion, and kidnapping. The market for human organs is big, he says, estimating that organ sales are involved in as many as 13,000 transplants each year, adding, "we are trying to report instances of organ trafficking to the appropriate authorities."

In 2011, Global Financial Integrity, a nonprofit research and advisory organization that analyzes international financial systems and illicit revenue, reported that the illegal organ trade had grown to be a $1.2 billion industry. The World Health Organization also reports that all-inclusive kidney transplant packages can be had, for those who can afford them, for prices ranging from $70,000 to $160,000.

In the United States, a vast health care network has evolved to facilitate transplants through both deceased and living donations. Health insurance helps meet the high costs of surgery and a lifetime of anti-rejection medication, enabling the middle class and even the poor to receive lifesaving organ transplants. That system, however, is not universal.

Wherever the rule of law has broken down, Delmonico says, you'll have people ready to prey upon the desperate, and there you'll find organ trafficking. In these destabilized regions of the world, such as Afghanistan, "people are taken from their villages, thinking they're going to have a job when they reach their destination. [Instead] they're taken to some place, confined," he says. "They're held, kidnapped. There is no job. And they're told, 'You'll sell your kidney or we'll harm you by turning you over to the Taliban.' That's human slavery."

At the end of the two-day summit, participants issued a statement, concluding that "organ trafficking and human trafficking for the purpose of organ removal are true crimes against humanity [that] need to be recognized as such by all religious, political and social leaders, and by national and international legislation ... we, the undersigned participants of the Pontifical Academy of Sciences Summit on Organ Trafficking and Transplant Tourism, resolve to combat these crimes against humanity through comprehensive efforts that involve all stakeholders around the world."

What would the best outcome for the summit look like? Ideally, Delmonico says, engaging governments, using the stature of the Pontifical Academy, to take action on organ trafficking. Realistically, he understands the situation may not change unless the academy has the support of a larger community of media, governments, and medical professionals.

"The best way to put it," he says, is "the summit is leading to action items, an action agenda to specific locations to make change." ■

Lab Investigates Parasites' "GENE SHUFFLING"

BY KATHERINE DVORAK

African trypanosomes are masters of disguise. Delivered through bites from the tsetse fly, once inside a host these parasites quickly disguise their appearance in a process called antigenic variation, all to avoid detection — and no parasite does it better.

But how do organisms like trypanosomes, in their effort to colonize an inhospitable environment, regulate their genes and fool an animal that doesn't want them there? That is the crux of Galadriel Hovel-Miner's research.

Hovel-Miner, Ph.D., assistant professor of microbiology, immunology, and tropical medicine, opened her lab at the George Washington University (GW) School of Medicine and Health Sciences (SMHS) in December 2015. Her goal was to uncover the genetics behind a parasite's ability to infect its host, and attribute those genes to their function. Doing so could expose gaps in the parasite's defenses, leading to future targeted therapeutics. When it comes to trypanosomes, Hovel-Miner notes, that goal is a little daunting; so far, more than 60 percent of the genome remains a mystery.

Trypanosomes thrive in sub-Saharan Africa and spread African sleeping sickness. Ultimately, the trypanosomes' genetic shroud enables them to slip across the blood-brain barrier undetected, where they enter the central nervous system. In the late stages of the disease, infected humans and other animals lose their sleep pattern; they sleep all day and are awake all night. The sleeping sickness itself, explains Hovel-Miner, is the end stage of the disease, caused by brain damage. The illness not only affects thousands of people living in sub-Saharan Africa, but also lays waste to livestock, financially devastating already poverty-stricken regions.

In addition to the human suffering the parasites create, Hovel-Miner says there are two other reasons her lab is interested in trypanosomes: They are the textbook parasite for antigenic variation, and their method of disguise is unique, accomplished by shuffling genes around in the genome.

That gene shuffling is perhaps one of the most intriguing aspects of her work, says Hovel-Miner. Trypanosomes, to perform antigenic variation, have only one gene expressed, or turned on, at a time. Unlike other pathogens that may have just a few antigenic genes at their disposal, trypanosomes have more than 2,000 cloaks with which to shroud their identity.

"How do you go from one [gene] to one of the other 2,000? That's really the question," Hovel-Miner says.

Normally, in a mammalian genome, moving the genes around would be very dangerous, she adds. "It's something you pretty much want to do only when you're an egg and a sperm coming together to make a new person or animal, a genetically unique one. A lot of times moving things around in the genome ... can result in genetic disorders and cancers. These are the kinds of actions that cause genetic damage, which can result in disease," she explains.

Understanding how trypanosomes efficiently move a silent gene from one position in the genome to become active in another position without incurring extra damage would open doors to an even better grasp not only of trypanosomes' use of antigenic variation, but also of the genetics associated with human disease overall, Hovel-Miner says.

The lab is also investigating the drug resistance of trypanosomes. Knowing which genes lead to drug resistance could help researchers identify new pathways associated with that resistance.

Although currently many stages away from the long-term goal of having a

testable drug, Hovel-Miner hopes to find a better treatment for the disease that would inhibit the growth of the trypanosome.

"There are drugs, but there are only a limited number of them, and while they're fairly effective, they're also highly toxic. There aren't very many of them, so drug resistance is a threat, and any resistance could be a real problem," she says.

To learn more about the parasites' genes, Hovel-Miner employs a genetic tool known as a "whole genome gain-of-function library."

"This is a library of every gene in the trypanosome genome that we can turn on when we want to. So we put all the genes that we have under our control into a population of cells, we treat the cells with a condition, and then we see what genes are present post-treatment," she explains.

Lab members are also modifying genes in the organism, as well as looking at how the genes of the trypanosome move through the genome.

"We know that [gene shuffling] begins with a DNA break, so we can look at how DNA breaks form and, following the formation of a DNA break, [examine] how things shuffle," Hovel-Miner adds. "It now looks like some of this is associated with cell division and cell division defects. We're starting to [look closely at] how the cells divide, because our data suggest that it's connected." ■

FROM PITCH TO PATIENTS

BY KATHERINE DVORAK

Robbie Russell walked onto the soccer pitch to the thunderous sound of 80,000 voices singing: "Die meister [the masterful], die besten [the best], les grandes equipes [the great teams], the champions."

That was 13 years ago, and Russell was a right back playing for Norwegian professional soccer club Rosenborg BK. It was one of his first matches in the Champions League, an elite European soccer tournament.

"To this day, hearing that song gives me goosebumps," he says.

Now a third-year M.D. student at the George Washington University (GW) School of Medicine and Health Sciences, Russell has come a long way from the soccer field. But every step he's taken — from playing for clubs in Norway, Denmark, Salt Lake City, and Washington, D.C. — has led him to his dream of practicing medicine.

Russell first came to GW looking to study orthopedic surgery; it's what impressed him from watching doctors tend to his teammates. Once at GW, his interests shifted to emergency medicine, partly because of the pace and the day-to-day challenges. "I love the fact that coming into work, I don't know what I'm going to see. It's very exciting; it's very scary," he says.

So far Russell is making the most of his time at GW. He serves as vice president of the Student National Medical Association, as co-president of the GW Emergency Medicine Interest Group, and as a member of the D.C. Department of Health's Medical Reserve Corps, managed by the GW Medical Faculty Associates, a medical response and disaster team.

Russell discovered his aptitude for soccer during high school. His mother worked three jobs to help support the family, but affording college seemed out of reach. Russell's prowess as a player paid off, however, and Duke University offered him an athletic scholarship.

Despite his success as an athlete, Russell says he was always drawn to science.

"I started off college as pre-med, but then I walked into my first calculus course and bombed it. So I thought, 'I can't threaten my GPA, I'll just do the general athlete program and go from there.'"

The "from there" turned into a 14-year professional soccer career that Russell greatly cherishes.

When Russell was traded to D.C. United in 2011, "everything started to align." He was finally living in the same city as his wife, Tiana, who worked in D.C. while he played for Real Salt Lake. After retiring from soccer, Russell completed a post-baccalaureate premedical program, and was accepted as an M.D. student at GW.

Russell now puts the focus and drive he showed on game day into his work at GW, and spends his free time with Tiana and their two sons, Leo and Lucas.

"Everything that's ever happened to me, good or bad, has taught me something. And if I don't apply it now, I'm doing those experiences a disservice," he says. "I hope to bring all of those experiences to my work in medicine." ■

Path through Paraguay

BY KATHERINE DVORAK

As a child growing up in a small village in western Paraguay called Santa Rosa, Cheralyn Hendrix, M.D., recalls standing by her father's side as he sewed up a gash from an ax wound on the palm of a 12-year-old boy's hand, and spending mornings and afternoons with her mother as she provided aid to the community of 150 people.

"That's really how my interest in medicine began, being this right-hand person in this tiny little clinic that my mom started," says Hendrix, a surgery resident at the George Washington University (GW) School of Medicine and Health Sciences (SMHS).

Hendrix's parents worked as missionaries in Paraguay for 25 years. Her mother started a vaccination program in the village and educated its members about medication adherence; her father helped with wound care and suturing.

Her parents' dedication to their patients and the community is at the core of what drives Hendrix in her work at GW. "They're so passionate about it, and I want my life to have that kind of passion," she explains.

Hendrix lived in Paraguay until she was 18, at which point she immigrated to the United States to pursue a career in medicine. She has moved all over the country with her husband, who serves in the U.S. Air Force, while raising four children, the youngest of whom is 9.

"They're really why I can do what I do," she says of her family. "I feel like I have an added measure of stability, because I have this incredible support structure at home. They're really proud of me, and I can't even tell you what that does for me [in terms of] spurring me on."

Hendrix earned her medical degree from the University of Arizona at Tucson, and now, in her second year of residency at GW, is pursuing trauma surgery. She made that career decision in part because of the hands-on time she spent helping her parents care for their patients in Paraguay.

"I never felt as invigorated or as inspired as I did when I was working on surgical rotation. That was the one thing I found in medical school, that it didn't matter how many hours I worked, I was thrilled to be working with my hands," she says. "I'd rather be tired and fascinated than working fewer hours and feeling like I'm not doing what I most enjoy. I love never knowing what's coming through the door."

STOMACHING SALT

BY KATHERINE DVORAK

With the support of grants from the National Institutes of Health (NIH), Pedro A. José, M.D., Ph.D., professor of medicine in the Division of Renal Diseases and Hypertension and professor of pharmacology and physiology at the George Washington University (GW) School of Medicine and Health Sciences, is exploring how the body disposes of salt. Salt sensitivity is an underdiagnosed condition of hypertension, and insight into the process may lead to more personalized treatments for patients.

Sodium channels in the stomach sense salt levels in the food, José says, and those cells secrete the hormone gastrin, to alert the kidneys that they need to make more dopamine; gastrin and dopamine team up to rid the body of the excess salt.

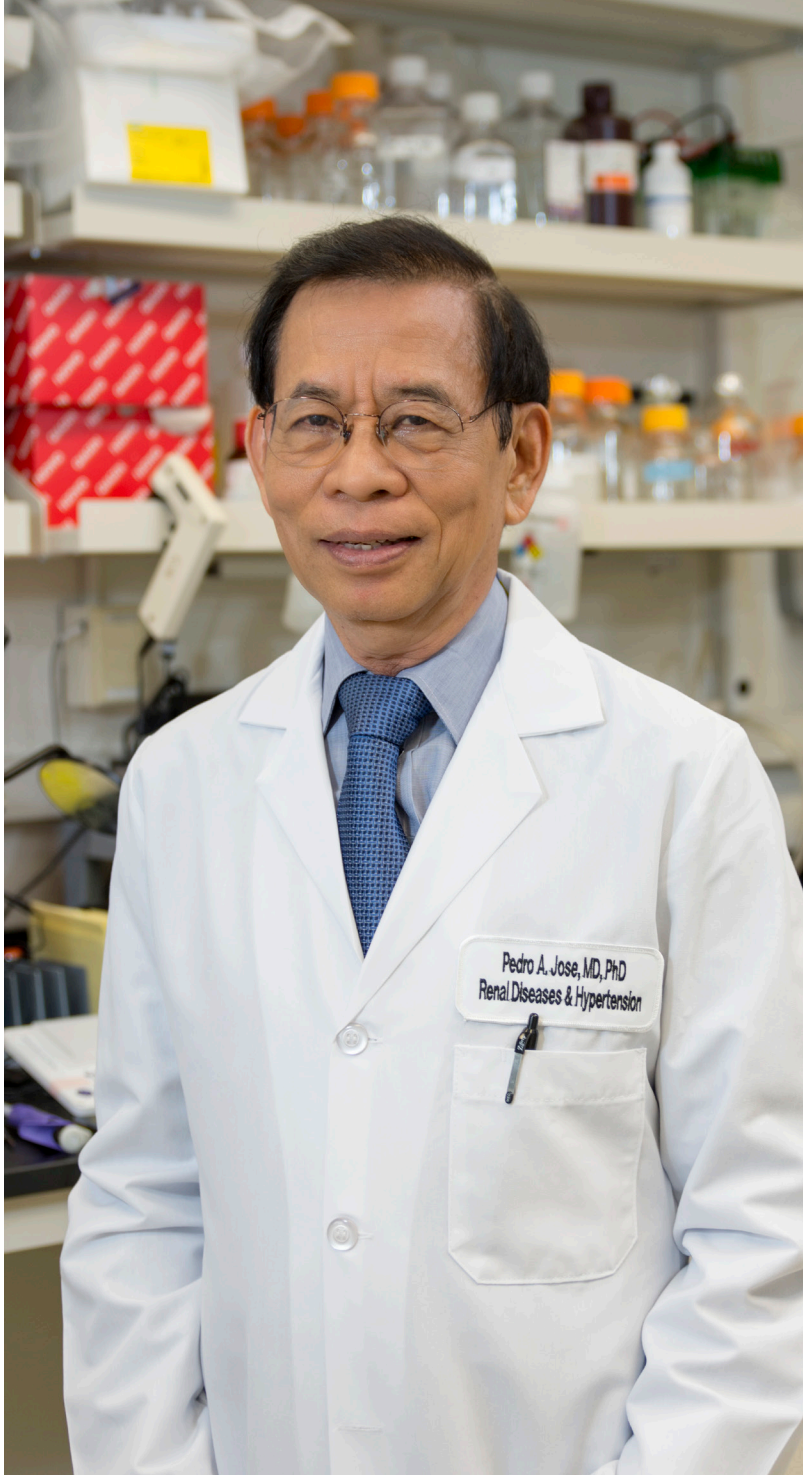
For some people, taking in too much salt will cause blood pressure (BP) to rise, but about 15 percent of people see higher BP if they take in too *little* salt, José says. The trouble, he adds, is that there's no way to know who falls under which category.

Discerning how the stomach senses salt levels, and the channel of communication through which gastrin tells the kidneys to make more dopamine, may lead to a better understanding of salt sensitivity, says José.

To investigate how the communication occurs, researchers put catheters into mice blood vessels that go into the stomach and the duodenum. Next, they added short interfering RNA (siRNA) to genetically disrupt the gene, he explains. "So, if you put in the siRNA ... [and] direct that against the sodium channel, you'll only be disrupting the sodium channel in the stomach and duodenum."

By limiting the disruptions just to sodium channels in the stomach, the technique prevents the body from making excess hormones in other areas that can be harmful, José adds.

The current NIH grants through which José is conducting his research include "Renal Dopamine-1 Receptor Defect in Hypertension," a recently renewed grant for a total of more than $1.7 million, as well as a grant totaling more than $3.7 million awarded to GW via the University of Virginia, for which José is a subcontractor, "Dopamine and Angiotensin Receptor Interactions in Genetic Hypertension."



In addition to his research at GW, José is wrapping up a yearlong stint as the chair of NIH's Hypertension and Microcirculation Study Section. The study sections review and approve grants admitted for funding.

"It's important that one [reviews the grants] to ensure the review process is fair, and that the review process really comes up with the best proposals to be funded by our government," he says.

It's not his first rodeo with NIH study groups. José previously chaired the same study section, which was previously called the Cardiovascular and Renal Study Section B, from 1996 to 1998. ■

FACULTY NEWS

Leading Education at GW Cancer Center

Robert Siegel, M.D. '77, has been selected to serve as the George Washington University (GW) Cancer Center's associate center director for education and training. Siegel joined the GW School of Medicine and Health Sciences in 1982 as a professor of medicine.

His research interests focus on refining therapies for breast and head/neck cancers. He has supervised the medical school's second-year program in hematology since the fall of 1982, and is the director of the GW Board Review Course, the largest program of its kind focusing on hematology and oncology in the country. ■

A New Disorder

M. Chiara Manzini's curiosity was piqued when she met a set of new patients.

"The patients were very short, and they had skeletal deficits," explains Manzini, Ph.D., an assistant professor at the George Washington University (GW) Institute for Neuroscience and the Department of Pharmacology and Physiology at the GW School of Medicine and Health Sciences.

In the severe forms of congenital muscular dystrophy she studies, patients typically present with progressive muscle weakness as well as intellectual disability and vision issues such as cataracts. The additional characteristics her patients displayed, however – short stature and unique skeletal features – were highly unusual.

Manzini collaborated with scientists from around the globe, and they discovered that the removal of a specific gene, INPP5K, resulted in the muscle disruption, lens disruption, and smaller brain that she had observed. In other words, Manzini and her fellow researchers had discovered a new type of congenital muscular dystrophy.

The group has since published two papers and is working to better understand how the INPP5K gene functions in the muscle and the brain.

"The gene is very interesting, so we're definitely going to keep pursuing it," Manzini says. "Hopefully, it's going to be interesting to other people. From a science standpoint, it's a different mechanism from what had been previously looked at in these disorders. It may change the way we think about them." ■

Crusading for Clinical Trials

Sitting in his office on the eighth floor of the Science and Engineering Hall, Mitchell Smith, M.D., Ph.D., associate center director for clinical investigations at the George Washington University (GW) Cancer Center, lays out his vision for a center that pioneers new treatments, rapidly delivers them to patients, and engages with the community it serves.

"It's always been the goal to take good care of patients, but now we want to be on the cutting edge in terms of research and providing access to new drugs for patients," he says.

In his role, Smith oversees all cancer clinical trials. He sees the GW Cancer Center becoming a hive of activity, opening new trials at a fast clip, while developing a strong focus on in-house science.

"We have to streamline all the paper and the regulations, make sure we can be nimble in terms of someone approaching us with an interesting study we want to do. We want to open those trials quickly, and we have to demonstrate that we can [attract] patients to them," he says.

Smith also works to enhance trust in the community to grow participation in the trials the center runs. It's the GW Cancer Center's job to reach out to people living in underserved communities and educate those residents, he adds. ■

Give Me Some Skin

An international survey on sun exposure behaviors and skin cancer detection found there are many imperfections and geographic inequalities in prevention of skin cancer.

Information from the study, published in the Journal of the European Academy of Dermatology & Venereology by researchers from La Roche-Posay and the George Washington University (GW) Department of Dermatology, could help inform future awareness campaigns developed to address the need to reduce the incidence of skin cancer.

With nearly 20,000 participants around the world, it was one of the largest international studies of its kind on consumer sun protection and behaviors. Survey results indicated that 88 percent of respondents were aware of the risks of developing skin cancer when exposed to the sun without protection. However, four in 10 respondents said they don't think to protect themselves from the sun outside vacation.

"This is a global wake-up call," says Adam Friedman, M.D., senior author for the study and associate professor of dermatology at the GW School of Medicine and Health Sciences. "There are still a lot of gaps in people not only actively monitoring for cancer, but preventing it."

According to the data, using sunscreen and wearing sunglasses were the most frequent preventive measures. Education level, as well as gender, influenced the degree of sun protection: A higher level of education corresponded to a higher level of sun protection. ■

The Connection between HIV and Cancer

With a $2.2 million National Cancer Institute grant, Douglas Nixon, M.D., Ph.D., chair of the Department of Microbiology, Immunology, and Tropical Medicine and Walter G. Ross Professor of Basic Science Research at the George Washington University (GW) School of Medicine and Health Sciences (SMHS), alongside GW collaborators, is examining how human endogenous retroviruses (HERVs) impact certain types of cancers.

HERVs are ancestral remnants of past viruses that, passing from mother to child, have been integrated into DNA. Nixon's research team, which has published studies on the effect of HIV infection on HERVs, has found there may also be a link between HIV and cancer.

"It appears that breast and prostate cancer are found less frequently in HIV-infected people than in the general population," Nixon says.

Nixon and his team hypothesized that HERVs stimulate an immune response, which surveils prostate and breast cancer cells that could be expressing the same HERVs. To test this theory, Nixon, with Ph.D. rotation student Matthew Bendall and Keith Crandall, Ph.D., director of the GW Computational Biology Institute at the Milken Institute School of Public Health at GW, developed "Telescope," a computational pathway program, to determine which HERVs are expressed in prostate, breast, and colon cancers, in patients with and without HIV.

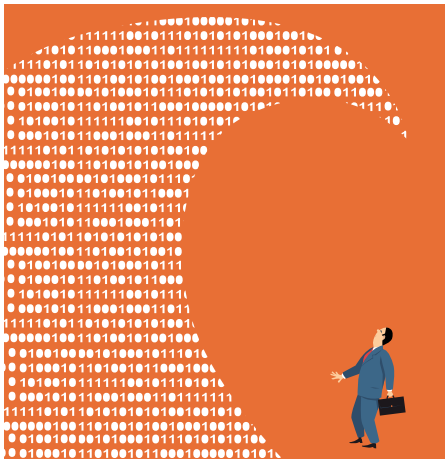
"This is really a brand new tool, which we think will be incredibly valuable to look for expression of these endogenous retroviruses in a number of different disease categories, including in cancer," Nixon says. ■

Patricia Berg Selected as 2016 AAAS Fellow

The American Association for the Advancement of Science (AAAS) named Patricia Berg, Ph.D., professor of biochemistry and molecular medicine at the George Washington University School of Medicine and Health Sciences, a fellow of the AAAS.

Berg was selected for her "important contributions to cancer research with the discovery of BP1 protein, activated in 80 percent of breast cancers and 70 percent of prostate cancers," according to the AAAS.

Berg also discovered that the presence of BP1 protein increases as breast cancer progresses from normal tissue to aggressive breast cancer. BP1 is associated with increased cell growth, resistance to drugs, and metastasis. Moreover, BP1 protein can control other genes, including several oncogenes known to cause breast cancer. Her work has had a dramatic effect on cancer research. ■



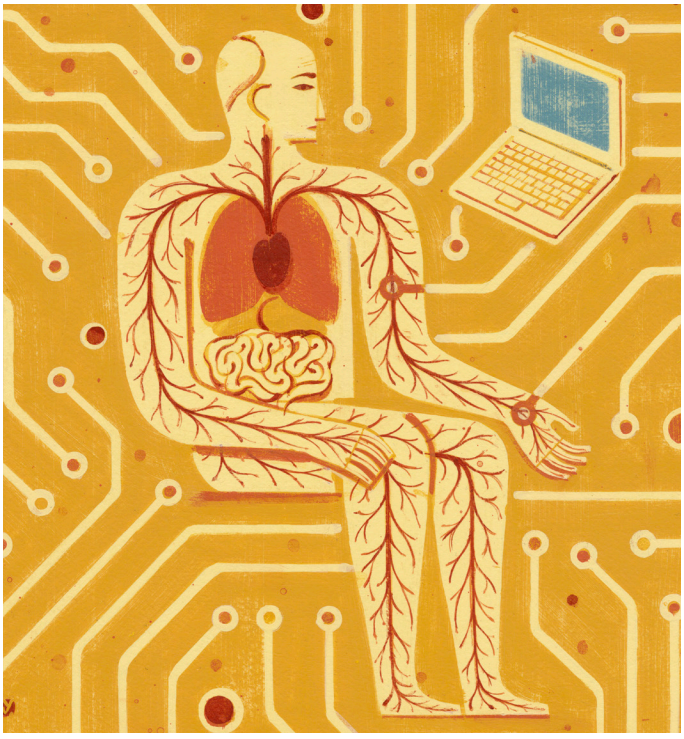
Streamlining a Solution

In March 2017, Raja Mazumder, Ph.D., associate professor of biochemistry and molecular medicine at the George Washington University School of Medicine and Health Sciences, and his team, including research associate Charles Hadley King, hosted a public workshop for more than 300 participants at the National Institutes of Health to get feedback on "biocompute objects."

Biocompute objects, or records with various data, such as validation kits, the associated metadata of executable programs, and software arguments and version information, could allow for consistent and accurate computation evaluations for studies submitted to the FDA. To jump-start the development process, however, Mazumder's team looked to the scientific community for input.

"The goal of the workshop was to develop a community and engage it in getting together to set these standards. We did a good job accomplishing that," King says, adding that the "biggest win" from the workshop was outside agencies agreeing to develop biocompute objects on their platforms.

The team is already planning another workshop for 2018. "[The March workshop] was well received, and we're [continuing] to work with the community because things like this require lots of collaboration and input," Mazumder says. ■



Between the Beats

A new technology, bioelectric impedance cardiography (ZCG), which assesses blood flow in the chest to make inferences about heart function, may lead to a new way to identify heart problems. Now, with the help of the Health Sciences Emerging Scholars grant, George Washington University's Josh Woolstenhulme, Ph.D., D.P.T., looks to prove the effectiveness of that technology.

Woolstenhulme, an assistant professor in the Department of Physical Therapy and Health Care Sciences, explains that ZCG is different from traditional tools used to assess heart function because it relies on the electrical impedance of blood in the chest to determine how much blood is pumped out of the heart during each beat.

The primary focus of Woolstenhulme's project is to validate the use of ZCG to assess diastolic function – the part of the heart cycle when the heart is between beats and filling with blood – while a patient is at rest, and while he or she is exercising. Validating the technology for this purpose might enable clinicians to better identify the presence of diastolic dysfunction. ■

Raising the Profile of Team-Based Care

Karen Wright, Ph.D., P.A.-C., interim chair and program director of the Department of Physician Assistant (P.A.) Studies at the George Washington University School of Medicine and Health Sciences, was recently selected by the board of the American Academy of Physician Assistants (AAPA) to serve a two-year term as the medical liaison between the AAPA and the National Association of Medical Minority Educators, Inc. (NAMME).

With a mission of transforming health care through patient-centered, team-based medical practice, said Senior Director for Professional Advocacy Ellen Rathfon, the AAPA puts a high priority on building relationships with other leading medical organizations. Wright, she added, was chosen to represent AAPA, and the P.A. profession as a whole, raising the profile of collaborative team-based care with physicians and other national medical groups.

"I see this as an opportunity to advance the strategic plans of both the AAPA and NAMME," said Wright, whose term begins July 1, 2017. "In order to achieve this goal, strategic partnerships between academic institutions, constituent organizations, and community stakeholders are paramount. Serving as medical liaison between the AAPA and NAMME will help advance this goal." ■

Election

The Physician Assistant Education Association (PAEA) now boasts leadership from two George Washington University School of Medicine and Health Sciences faculty members: Lisa Mustone Alexander, Ed.D. '03, P.A.-C ., M.P.H. '89, professor of physician assistant studies, was elected president, and Howard Straker, P.A.-C., M.P.H., assistant professor of physician assistant studies, will serve a second term as secretary. ■

Leadership and Service

Benjamin Blatt, M.D., professor of medicine at the George Washington University (GW) School of Medicine and Health Sciences, received the 2017 Distinguished Service and Leadership Award presented by the Association of American Medical Colleges Northeast Group on Educational Affairs (NEGEA).

The Distinguished Service and Leadership Award is presented to individuals selected by the steering committee who offer a significant contribution to the NEGEA initiatives through the years. "There are other people who have made great contributions," Blatt said of the honor. "I'm lucky to be the one who was selected." His contributions include serving in NEGEA leadership positions, founding several initiatives, delivering numerous presentations, and coordinating two annual meetings at GW.

Blatt received the award during the 2017 NEGEA Education Meeting at the University of Rochester School of Medicine and Dentistry, May 6. ■

Mary Ottolini Receives Lifetime Medical Education Achievement Award

Mary Ottolini, M.D., M.P.H., vice chair of medical education at Children's National Health System and professor of pediatrics at the George Washington University School of Medicine and Health Sciences, received a Lifetime Medical Education Achievement Award from the Council on Medical Student Education in Pediatrics (COMSEP).

COMSEP was established in 1992 with the support of the Association of Medical School Pediatric Department Chairs and became an independent organization in 2015. It promotes the importance of pediatric medical student education. ■

Setting the Standard for Safe Practices

John M. Young, D.P.S., assistant professor of clinical research and leadership at the George Washington University School of Medicine and Health Sciences, was recently appointed to the Federation of State Boards of Physical Therapy (FSBPT) board of directors.

For more than 25 years, the FSBPT has paved the way for public protection by providing service and leadership that promote safe physical therapy practices. The board of directors for the FSBPT includes members of member boards, of which there are 53, administrators of member boards, and public members. Young was elected for a one-year appointment with the option of renewal up to 10 years. ■

Leading the Way

Juliet Lee, M.D., assistant professor of surgery at the George Washington University School of Medicine and Health Sciences, recently joined the ranks of the International Association of Health Care Professionals (IAHCP) with her upcoming inclusion in *The Leading Physicians of the World.* The IAHCP, a networking organization, is composed of more than 30 different medical specialties and provides members with a platform for connecting with others in the industry, including patients, experts, and colleagues. ■

CLASS NOTES

1960s

Vincent T. Devita Jr., M.D. '61, HON. '84, received the 2017 Yale Cancer Center Lifetime Achievement Award.

David Henry Goodman, M.D. '63, was named Clinical Professor Emeritus by the Department of Medicine at George Washington University School of Medicine and Health Sciences.

1970s

Paul B. Roth, M.D. '76, FACEP, was awarded the New Mexico Spirit of Achievement Award by National Jewish Health.

John Joseph Wells, M.D. '78, was awarded Top Doc in *Phoenix* magazine.

1980s

Andrea Carpenter, M.D. '89, Ph.D., served as president of the Southern Thoracic Surgical Association in 2016.

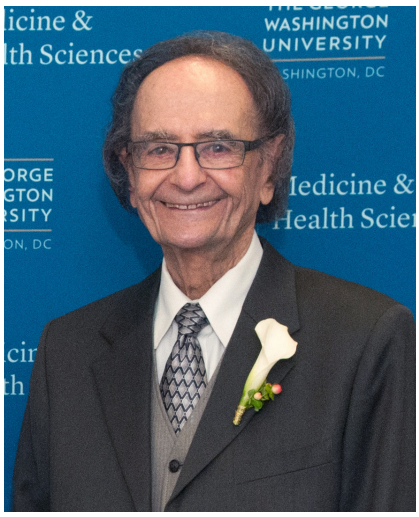
Robert C. Hendel, M.D. '83, was appointed as the Sidney W. and Marilyn S. Lassen Chair in Cardiovascular Medicine, chief, Section of Cardiology, director of Tulane Heart and Vascular Institute.

Peter Kaufman, M.D. '80, was named Fellow of the American Gastroenterology Association and also named a *Washingtonian* Top Doc for the second year.

James Longobardi, D.P.M., M.B.A., P.A. '80, was elected chief of surgery, Mercy Scripps Chula Vista, 2017–19.

1990s

Nathaniel Beers, M.D. '95, CERT '04, FAAP, assumed the role of CEO of the HSC Health Care System, a nonprofit health care organization in Washington, D.C., in May 2017. In this role, he oversees the HSC Pediatric Center, both inpatient and outpatient services, HSC Home Care and residential services, health services for children with special health care needs, the Medicaid managed care provider for children and youth with disabilities in D.C., and the HSC Foundation.



Oscar I. Dodek Jr., M.D. '56, J.D. '85, Professor Emeritus of Obstetrics and Gynecology at the George Washington University (GW) School of Medicine and Health Sciences (SMHS), died March 2, 2017.

A native Washingtonian, Dodek had a lengthy career as a physician specializing in reproductive endocrinology. At SMHS, he served as a clinical professor of obstetrics and gynecology for 35 years and became Professor Emeritus in 1998. He was the first board-certified reproductive endocrinologist in the Washington, D.C., area, and specialized in the latest techniques to combat infertility. In 1978, Dodek established the Division of Reproductive Endocrinology at GW.

Dodek earned his M.D. degree from GW in 1956. He completed his residency training in obstetrics and gynecology at Mount Sinai Medical Center and served a fellowship at the Worcester Foundation for Experimental Biology. In 1985, Dodek graduated from GW Law School and became a member of the Order of the Coif, an honor society for United States law graduates.

Dodek had many civic and philanthropic interests and was a passionate advocate for human rights and women's issues. The Kane-King-Dodek Obstetrical Honor Society was established to recognize the leaders in the department of obstetrics and gynecology at GW. The Oscar I. Dodek and Mildred S. Dodek and Joan B. and Oscar I. Dodek Jr., M.D. '56, J.D. '85, professorship, established in 1982, has been held by a notable list of SMHS leaders, including the current Dodek Professor and Chair, Nancy D. Gaba, M.D. '93, RESD '97, FACOG, who was installed Oct. 8, 2014.

Kendalle Cobb, M.D. '96, received the Chief of Staff Award from the Cleveland Clinic. The $25,000 grant will be used to explore the challenges and successes the Cleveland Clinic faces in creating a culture of diversity and inclusion.

Erin Hogan, B.S. '98, Emergency Medical Services, was promoted to philanthropic market executive, Southeast U.S., U.S. Trust, Bank of America Private Wealth Management.

Elizabeth Ann Ignacio, M.D., RESD '98, served as president of the Hawaii Radiological Society, state chapter of American College of Radiology, 2016–17.

John G. Pattaras, M.D. '92, RESD '99, associate professor of urology at Emory University School of Medicine, was named Emory's James C. Kennedy Chair in Prostate Surgery. He is also the chief of Emory urology services at Saint Joseph's Hospital and director of minimally invasive surgery.

CLASS NOTES

Edgar Ratilla, CERT '95, Health Science Laboratory Technology, obtained the American Society for Quality's certified manager of quality/organizational excellence designation.

John S. Symington, M.D., RESD '91, became president of the INOVA Mt. Vernon Hospital staff.

2000s

Petros Carvounis, M.D., RESD '05, was recognized as a Top Doctor in ophthalmology in *Houstonia* magazine.

Brett F. Holt, M.D. '06, RESD '08, was featured in the International Association of Health Care Professionals urologist publication *The Leading Physicians of the World*. Holt is a board-certified urologist specializing in urinary tract disease and the male reproductive system, and is a robotic surgery expert.

Hope T. Jackson, M.D. '09, RESD '16, CERT '14, minimally invasive surgery foregut/bariatric surgery fellow at the University of Washington Medical Center, was selected as one of the 2017 National Minority Quality Forum 40 Under 40 Leaders in Minority Health.

Supriya Jagannath-Vanguri, M.D. '02, B.A. '98, serves as an oral board examiner for the American Board of Anesthesiology.

Lt. Commander Ian Marks, P.A. '00, CERT '00, graduated from the United States Naval War College in the fall of 2016. He is the first Coast Guard physician assistant to earn a diploma from the Naval War College and is currently serving as the senior medical officer for the U.S.C.G. clinic in the port of Los Angeles.

Thomas Maruna, B.S. '09, A.A. '06, CERT '05, Clinical Laboratory Sciences, received the Junior Officer Medical Laboratory Scientist of the Year Award from the United States Public Health Service.

Louis Miller, M.D. '03, B.A. '99, received the New York University Department of Medicine Teacher of the Year award.

Lauryn Rochlen, M.D. '04, was selected to serve as a board examiner for the American Board of Anesthesiology.

Jaspal Singh, M.D. '06, B.A. '02, was named co-director of the recently opened Weill Cornell Medicine Center for Comprehensive Spine Care in New York City. Singh also serves as the medical director of outpatient faculty practice in the Department of Rehabilitation Medicine at Weill Cornell Medical College.

Jennifer M. Stonebrook, M.S. '09, Health Sciences, earned certification as a hospice and palliative care administrator through the Canadian Hospice Palliative Care Association.

2010s

Megan Evans, M.D. '11, was appointed assistant professor at Tufts Medical School and associate program director of the Tufts OB/GYN residency program.

Pooja Lakshmin, M.D., RESD '16, joined the faculty of the George Washington University School of Medicine and Health Sciences Department of Psychiatry and Behavioral Sciences as an assistant professor. She specializes in reproductive psychiatry and women's mental health.

Sarah R. Miller, D.P.T. '11, was named as a fellow at the American Academy of Orthopedic Manual Physical Therapy.

Grace A. Montenegro, M.D., RESD '11, earned board certification from the American Board of Colon and Rectal Surgery.

Resmi Premji, M.D., FEL '16, recently earned board certification in endocrinology, diabetes, and metabolism.

IN MEMORIUM

James C. Bruce, M.D. '51, RESD '55

Arnold L. Case, M.D. '60

William Chin-Lee, M.D. '47

William S. Costello, CERT '95

Paul R. Dinsmore, M.D. '58

Morris Feitel, M.D. '57

Lynn D. George, M.D. '56, B.A. '53

Walter E. Goozh, M.D. '57, B.A. '54

Stephen B. Hiltabidle, M.D. '55, RESD '59

Frank Mate Jr., M.D. '56

John G. McGregor Jr., M.D. '53

Mazhar Rishi, M.D., RESD '90

John Norton Robinson, M.D. '63

Dennis D. Shepard, M.D. '63

Harold H. Shively, M.D. '65

Nelson P. Trujillo, M.D., RESD '65

A. James Watt, M.D. '71

Emily Wilson, P.A.-C. '91

Jean L. Fourcroy-Behr, M.D., Ph.D., RESD '79, M.P.H., died in October 2016. Fourcroy-Behr was the first woman admitted to the George Washington University School of Medicine and Health Sciences urology residency program. In 1981, Fourcroy-Behr became only the fifth woman in the country to earn board certification in urology.

In 2013, in recognition of her fierce determination and her guidance as a role model for women entering the field of urology, SMHS established the Jean L. Fourcroy-Behr, M.D., Research Award, thanks to a generous gift from Fourcroy-Behr and her husband Armin Behr.

"I hope it will encourage more residents to take an interest in research, and more faculty and others to be supportive," said Fourcroy-Behr at the time.

IN DEVELOPMENT

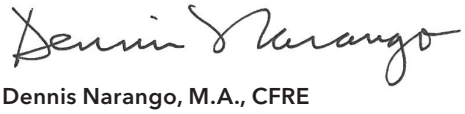
Scholarships for our medical and health sciences students remain our most important priority for fundraising as we close out the fiscal year on June 30. Our Adopt-a-Doc scholarship donors have expressed personal satisfaction from giving through the program because it offers them an opportunity to connect with their sponsored students. The Adopt-a-Doc program provides $5,000 per year over four years through an annual pledge payment, which helps make a small, but meaningful, dent in the debt load upon graduation.

Students in the physician assistant, physical therapy, and other health sciences programs face similar debt challenges. We are committed to alleviating their burdens as well.

Any of our development officers can discuss our programs with you, and you can find information on our website: *smhs.gwu.edu/give*. We invite you to look into it.

Already this year, the George Washington University School of Medicine and Health Sciences (SMHS) has benefited from larger contributions to the Power & Promise scholarship fund, which provides aid to students with financial need. This spring, we received a nearly half-million-dollar bequest from the estate of a grateful alumnus. Gifts of all sizes and the income generated by endowed funds are the lifeblood of our scholarship program. We are very grateful to the generous GW donors who have joined us in the effort to help SMHS students graduate with less debt, and we invite everyone to join this important cause.

Sincerely,



Dennis Narango, M.A., CFRE
Associate Dean, SMHS and Associate Vice President for
GW Medicine Development and Alumni Relations

If you are 70 ½ or older, you can take advantage of a simple way to benefit the GW School of Medicine and Health Sciences and receive tax benefits in return. You can give up to $100,000 annually from your IRA directly to SMHS without having to pay income taxes on the money. These gifts count toward your IRA's minimum distribution requirements and benefit you regardless of whether you itemize deductions on your income tax returns. Visit gwu.planmylegacy.org/ira-charitable-rollover for more information.

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Cultivating Strengths Within Health Sciences

Senior Associate Dean for Health Sciences Reamer L. Bushardt, Pharm.D., P.A.-C., DFAAPA, discusses how his background and experiences – from growing up as the son of a pharmacist in a quiet South Carolina community to his years as professor and chair of the Department of Physician Assistant Studies at Wake Forest Baptist Medical Center's School of Medicine – will shape his efforts to support the health sciences programs at GW. **Read more on page 12.**